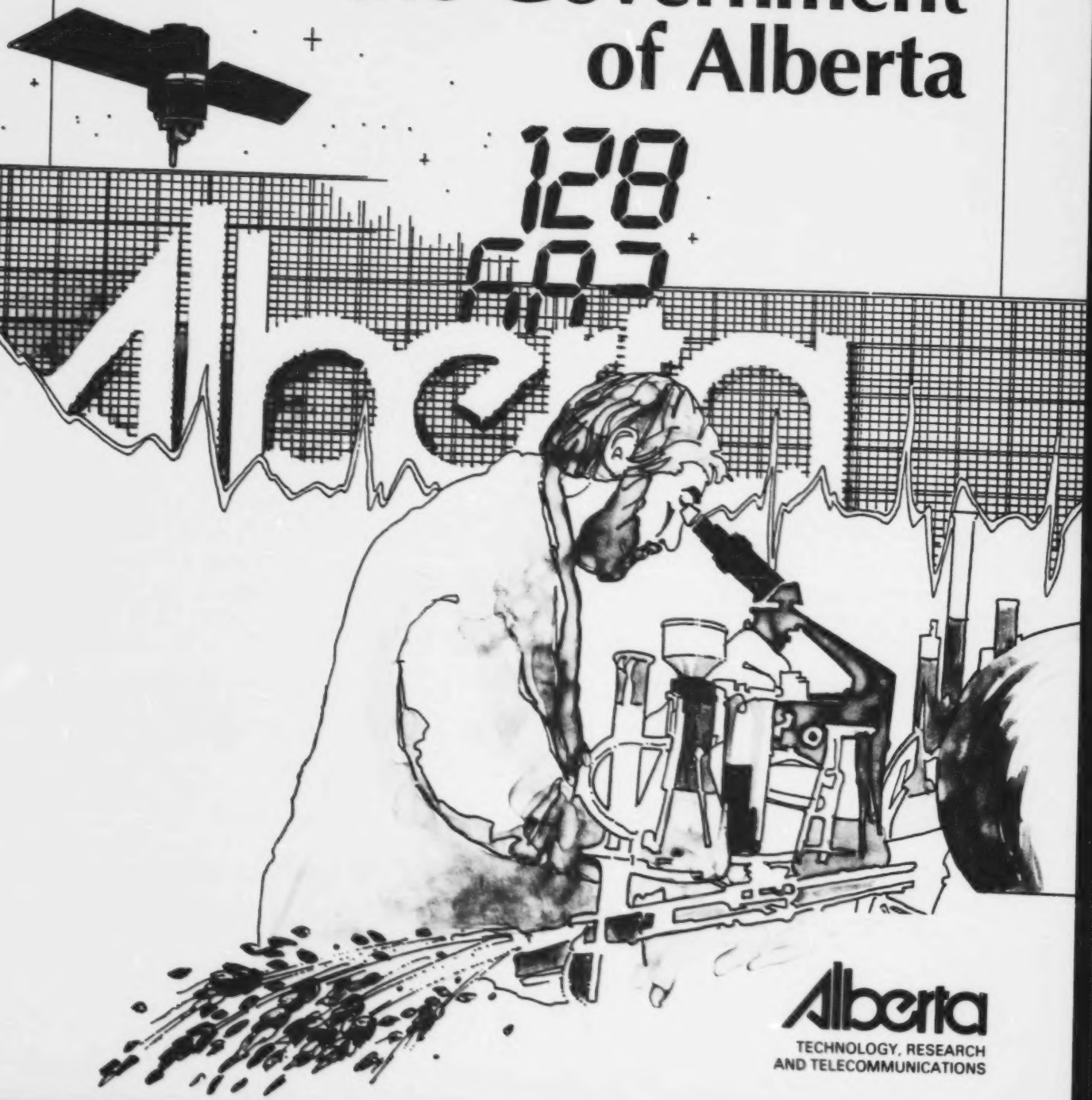
1988-1989
SURVEY RESULTS

Scientific Activities of the Government of Alberta



Alberta
TECHNOLOGY, RESEARCH
AND TELECOMMUNICATIONS

91-00420/

SCIENTIFIC ACTIVITIES OF THE GOVERNMENT

OF ALBERTA

1988-89 SURVEY RESULTS

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Note:
The Science and Technology Statistics Program has merged with the Program on Service Industries to form the Services, Science and Technology Division.

JANUARY, 1990

FOREWORD

This report results from the fifteenth annual survey of scientific activities of the Government of Alberta conducted in June 1989.

The first surveys of government scientific activities at the provincial level were conducted in the provinces of Ontario, Alberta and Nova Scotia in 1974; Saskatchewan was included in 1975, British Columbia in 1977. Nova Scotia dropped out of the survey in 1977 due to lack of science policy user groups within the province. In 1984 New Brunswick carried out its first survey, including only natural science activities. Manitoba joined in 1985 and Newfoundland in 1986. Nova Scotia renewed its participation in 1988. In 1989, Quebec was added. Reports for other provinces, similar to this one are available on request from the representatives identified at the end of this report.

Science surveys, like many other surveys, are based on the respondents' interpretation of definitions and methods of calculation. Accounting records, which use a science-based classification are rarely available. Notwithstanding that the data are estimates, they are a good representation of current science expenditures and manpower utilization for the province.

Surveys of the scientific activities of provincial governments serve several purposes. They provide an essential data base for analysis and the formulation of provincial science policy. They also provide data for the development of a national aggregate R&D series. National aggregates are published by Statistics Canada in **Science and Technology Indicators,** (Catalogue No. 88-201) and **Resources for Research and Development in Canada,** (Catalogue No. 88-203). Many of the science publications are listed at the end of this report. The national aggregates are also needed to complete the international questionnaires for the Organization for Economic Cooperation and Development (OECD) and the United Nations Education, Science and Culture Organization (UNESCO).

This is the second year that person-years and associated costs devoted to the administration of extramural programs (AEP) are being shown separately. These data have in previous years been included with the intramural activities of the individual departments.

The 1988-89 survey was conducted by Alberta Technology, Research and Telecommunication with the assistance of Rose Krakower of the Services, Science and Technology Division of Statistics Canada. The latter provided recommendations and compiled the report with the help of Line Blais. Any questions pertaining to the data should be directed to Jan Speirs of Alberta Technology, Research & Telecommunications. The success of any survey is largely due to the goodwill and efforts of the officials of the responding departments. Their efforts in completing the questionnaire are gratefully acknowledged and appreciated.

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	All Sciences		Natural Sciences		Social Sciences and Humanities	
	Table	Page	Table	Page	Table	Page
Historical Series:						
Total Expenditures:						
by Activity	1	18	23	53	45	83
by Department	2	19	24	54	46	84
by Performer	3	20	25	55	47	85
Total Expenditures on R&D:						
by Performer	4	20	26	55	48	85
by Department	5	21	27	56	49	86
Departmental Personnel Engaged in Science Activities	6	22	28	57	50	87
Expenditures in 1988-89 Fiscal Year:						
Total Expenditures:						
by Sources of Funds	7	24	29	58	51	88
by Activity and Performer	8	26	30	59	52	89
by Department and Performer	9	28	31	60	53	90
by Department and Activity	10	29	32	61	54	91
Total Expenditures on R&D by Department and Performer	11	30	33	62	55	92
Intramural Expenditures by Department and Type of Expenditure	12	31	34	63	56	93
Departmental Personnel Engaged in Science Activities	13	32	35	64	57	94
Objectives of Expenditures:						
by Department	14	35	36	66	58	96
by Activity	15	38	37	69	59	99

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Statistical Tables

	All Sciences		Natural Sciences		Social Sciences and Humanities	
	Table	Page	Table	Page	Table	Page
Estimates for 1988-89 Fiscal Year:						
Total Expenditures:						
by Activity and Performer	16	40	38	70	60	100
by Department and Performer	17	41	39	71	61	101
by Department and Activity	18	42	40	72	62	102
Total Expenditures on R&D by Department and Performer	19	43	41	73	63	103
Departmental Personnel Engaged in Science Activities	20	44	42	74	64	104
Objectives of Expenditures:						
by Department	21	46	43	76	65	106
by Activity	22	49	44	79	66	109

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The following symbols are used in this report:

- `-` nil or zero
- e estimated by Statistics Canada
- r revised figures
- ... figures not available or not applicable
- -- too small to be expressed

HIGHLIGHTS

In the 1988-89 fiscal year the Government of Alberta spent $234 million or 2.3% of total budgetary expenditures on science activities. While total government expenditures for 1989-90 are estimated to increase by 7.1%, scientific expenditures are expected to decrease by 0.6%. This will be the third consecutive year with a decrease reported for scientific activities.

Figure I Total Expenditures on Scientific Activities by Science Type, 1982-83 to 1989-90

Year	Natural sciences			Social sciences			Total		
	R&D	RSA	Total	R&D	RSA	Total	R&D	RSA	Total
	($'000)								
1982-83	136,041	32,949	168,990	1,714	42,124	43,838	137,755	75,073	212,828
1983-84	152,812	37,215	190,027	2,468	46,373	48,841	155,280	83,588	238,868
1984-85	184,252	40,401	224,653	2,748	49,313	52,061	187,000	89,714	276,714
1985-86	175,733	41,820	217,553	3,634	51,191	54,825	179,367	93,011	272,378
1986-87	245,387	43,605	288,992	6,535	37,900	44,435	251,922	81,505	333,427
1987-88	170,123	41,441	211,564	2,573	28,774	31,347	172,696	70,215	242,911
1988-89	147,606	57,392	204,998	5,017	24,429	29,446	152,623	81,821	234,444
1989-90e	156,386	48,078	204,464	4,565	24,015	28,580	160,951	72,093	233,044

Of the total 1988-89 science expenditures, 87%($205 million) was for activities in the natural sciences. Total research and development(R&D) expenditures accounted for 65% ($153 million). The proportion of R&D expenditures to total science expenditures in the natural sciences was 72% ($148 million) in contrast with 17% ($5 million) in the social sciences. R&D expenditures in the natural sciences were budgeted mainly by four departments or agencies.

Chart 1.

Total Expenditures on Scientific Activities, by Type of Activity, 1982–83 to 1989–90(e)

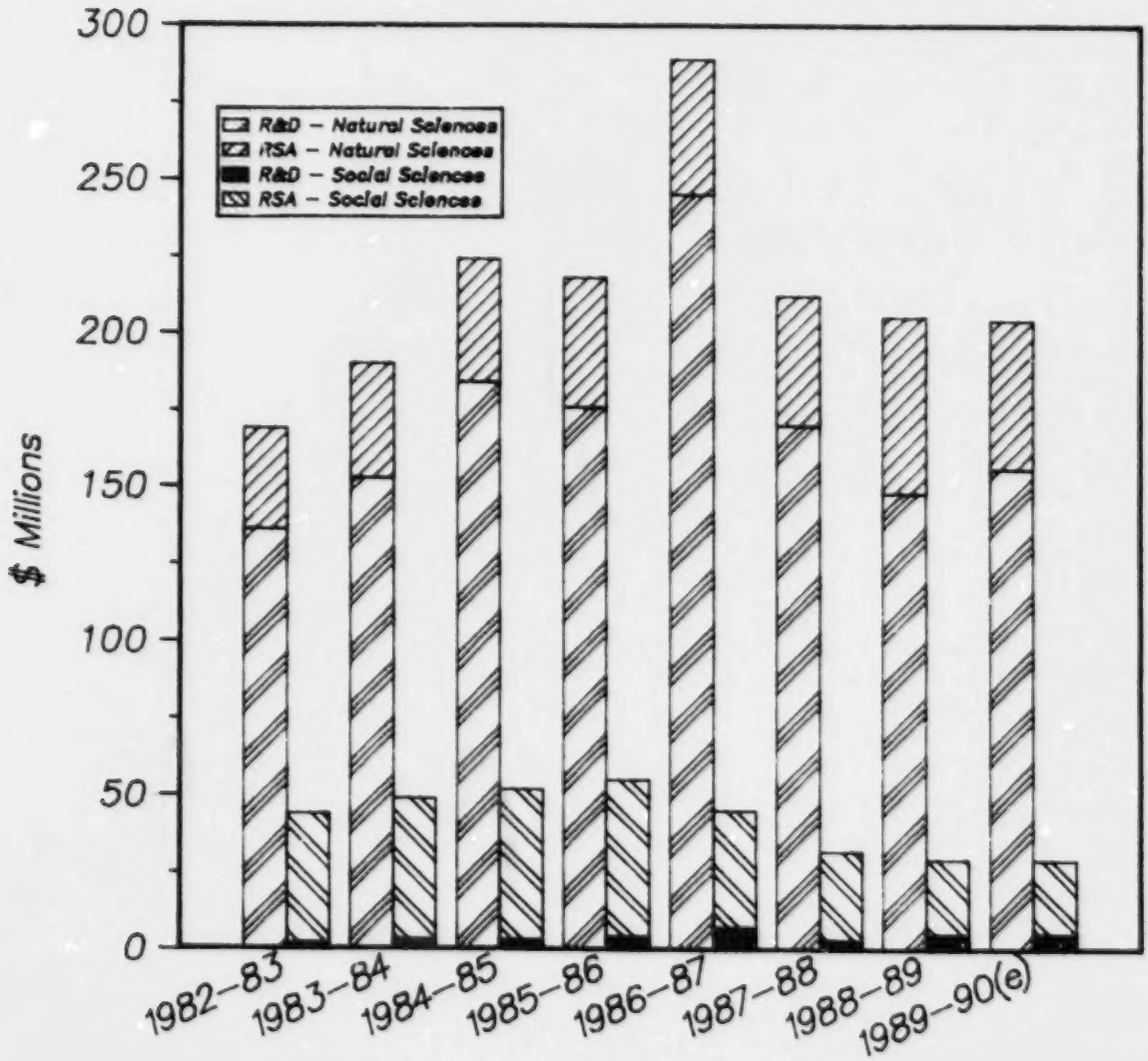


Figure II Total Expenditures on R&D in the Natural Sciences, 1982-83 to 1989-90

Department or Agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Executive Council[1]	19,148	19,950	21,463	26,209	...	...	...	...
Agriculture	13,699	15,782	11,937	12,471	10,153	9,820	13,315	13,410
Alberta Heritage Foundation for Medical Research	20,659	26,656	31,901	43,007	56,475	50,919	37,365	34,492
Hospitals and Medical Care .	16,865	19,769	17,725	21,121	22,080	2,285	...	...
AOSTRA	41,105	40,639	77,132	52,808	78,917	36,299	30,235	37,952
Technology, Research and Telecommunications	...	...	...	...	52,854	49,329	45,509	43,344
Other	24,565	30,016	24,094	20,117	24,908	21,471	21,182	27,188
TOTAL	**136,041**	**152,812**	**184,252**	**175,733**	**245,387**	**170,123**	**147,606**	**156,386**

1 Prior to 1987-88 The Alberta Government provided financial assistance to the Alberta Research Council (ARC) under Vote 6. This was administered by the Executive Council. In 1986-87 the Department of Technology, Research and Telecommunications was formed and took over the administration of this transfer of funds to ARC.

The changes in expenditures of the major science departments are shown in Figure III. The Department of Forestry, Lands and Wildlife has reported the largest increase. The area affect was primarily technical surveys. While the total budget of the Department of Environment has remained almost level, reported science activities, excluding the Environmental Center, have decreased by 55% between 1987-88 and 1988-89. Similarly, the mandate and budget of the Department of Culture and Multiculturalism has not changed significantly over the last few years, however, the reported science expenditures are continuing to drop and for 1988-89 account for 10% of their departmental expenditures.

Figure III Total Expenditures on Scientific Activities by Major Department, 1987-88 and 1988-89

Major Department or agency	1987-88	1988-89	Percentage change over 1987-88
	($'000)		%
Agriculture	17,626	20,776	17.9
Culture & Multiculturalism	7,433	4,799	-35.4
Environment	14,498	6,556	-54.8
Environmental Centre	11,076	11,126	0.5
Forestry, Lands & Wildlife[1]	6,715	22,092	329.0
Alberta Heritage Foundation for Medical Research	51,167	37,623	-26.5
AOSTRA	36,299	32,957	-9.2
Technology, Research and Telecommunications	51,297	53,000	3.3
Sub-total	196,111	188,929	-3.7
Other	46,800	45,515	-2.7
TOTAL	**242,911**	**234,444**	**-3.5**

1 Values reported for Forestry, Lands & Wildlife reflect the inclusion of the Land Information Services for the first time in 1988-89. Historical revisions will be incorporated in the 1989-90 survey report.

For 1988-89, $153 million was allocated to research and development. Almost 55% of this amount was in support of R&D activities in the industry and university sectors. The Department of Technoloy, Research and Telecommunications funded approximately 37% of the extramural R&D activity. The industry sector and the Alberta Research Council were the prime recipients of these funds. The Department of Agriculture and the Environmental Center performed, 65% and 83% respectively of their R&D activity intramurally.

Over 70% of the related scientific activities (RSA) were intramural. Approximately 34% of the RSA was performed by three government departments and agencies notably the Departments of Forestry, Lands and Wildlife, Agriculture and Transportation and Utilities.

Figure IV Total Expenditures on Scientific Activities by Sector of Performance, 1988-89

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council	Other	Total
	($'000)						
Natural Sciences:							
R&D	26,910	33,303	47,837	1,383	29,938	8,235	147,606
RSA	39,310	10,636	4,865	40	1,473	1,068	57,392
Social Sciences:							
R&D	2,428	1,589	476	-	5	519	5,017
RSA	18,326	3,550	1,618	-	-	935	24,429
All Sciences:							
R&D	29,338	34,892	48,313	1,383	29,943	8,754	152,623
RSA	57,636	14,186	6,483	40	1,473	2,003	81,821
TOTAL	**86,974**	**49,078**	**54,796**	**1,423**	**31,416**	**10,757**	**234,444**

Of the $49 million of provincial funds allocated to the industrial sector, $35 million (71%) was devoted to R&D. AOSTRA, and Technology Research and Telecommunications, together accounted for 64% ($31 million) of these funds. The Alberta Heritage Foundation for Medical Research and the Department of Technology, Research and Telecommunications were the chief provincial funders of the university sector. Together they provided 81% of the $55 million funded, of which $48 million was devoted to R&D.

In this report, the scientific activity of the Alberta Research Council reflects only that portion funded by the government of Alberta. Of the ten sponsoring departments, the Department of Technology, Research and Telecommunications was the largest source, transferring approximately $24 million. Additional information on the activity of the Alberta Research Council is available in Science Statistics, Catalogue No 88-001, Vol 14 No 1.

Figure V Total Expenditures on Scientific Activities by Sector of Performance and Major Department, 1988-89

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council	Other	Total
	($'000)						
Agriculture	14,830	1,112	2,330	-	723	1,781	20,776
Environment	3,749	1,596	30	-	174	1,007	6,556
Environmental Centre	10,143	800	103	-	75	5	11,126
Forestry, Lands & Wildlife .	15,407	5,421	314	-	822	128	22,092
Alberta Heritage Foundation for Medical Research	1,376	-	33,313	-	-	2,934	37,623
AOSTRA	8,009	15,964	3,535	-	4,714	735	32,957
Technology, Research & Telecommunications	482	15,504	11,301	40	23,650	2,023	53,000
Transportation & Utilities .	8,480	233	148	-	347	451	9,659
Other		8,448	3,722	1,383	911	1,693	40,655
**TOTAL	**86,974**	**49,078**	**54,796**	**1,423**	**31,416**	**10,757**	**234,444**

Figure VI Objectives of Science Expenditures, 1988-89 and 1989-90

Objective	1988-89		1989-90e	
	($'000)	%	($'000)	%
Advancement of science	177	0.1	192	0.1
Energy and fuels:				
Fossil Fuels	37,404	16.0	48,038	20.6
Other	1,331	0.6	1,874	0.8
Environmental issues:				
Air	1,442	0.6	1,573	0.7
Water	3,383	1.5	3,078	1.3
Other	2,438	1.0	1,832	0.8
Health	47,900	20.4	46,768	20.1
Industrial and economic development:				
Agriculture	23,947	10.2	23,700	10.2
Forestry	4,066	1.7	3,405	1.4
Manufacturing	53,036	22.6	45,438	19.5
Other	5,464	2.3	5,407	2.3
Social development:				
Culture, sport & recreation	6,495	2.8	4,998	2.1
Education	6,193	2.7	4,155	1.8
Other	27,145	11.6	27,190	11.7
Transportation	10,646	4.5	11,271	4.8
All other	3,377	1.4	4,125	1.8
TOTAL	**234,444**	**100.0**	**233,044**	**100.0**

The major applications of science expenditures are reflected in Figure VI. Almost 37% of available science funds were devoted to industrial and economic development. The two major supporters of this objective were the Departments of Technology, Research and Telecommunications and Agriculture.

As expected, social development is the focus of science activities in the social sciences. The Departments of Culture and Multiculturalism, Education, Municipal Affairs and Solicitor General were the main supporters.

Figure VII Departmental Personnel Engaged in Scientific Activities by Science Type and Category, 1988-89

Science type and activity	Scientific and professional	Technical	Other	Total
	(person-years)			
Natural sciences:				
R&D	137	158	44	339
RSA	256	533	107	896
AEP	46	16	56	118
Total	439	707	207	1,353
Social sciences:				
R&D	34	27	24	85
RSA	229	91	89	409
AEP	7	1	2	10
Total	270	119	115	504
All sciences:				
R&D	171	185	68	424
RSA	485	624	196	1,305
AEP	53	17	58	128
Total	709	826	322	1,857

Approximately 6% (1,857 person-years) of the provincial labour force were engaged in provincial government scientific activities in 1988-89. Reported personnel costs for this period accounted for 72% ($63 million) of total intramural expenditures. Thus the average annual salary for those individuals involved in scientific endeavors was less than $34 thousand.

Of the 1,857 person-years involved in science activities, 38% were in the scientific and professional category and 44% were classified as technicians. Technical personnel were predominant in the natural sciences accounting for 707 of the 1,353 person-years.

In the social sciences approximately 54% of the person-years were considered as "scientists and professionals". Related scientific activities accounted for 66% of the intramural science expenditures and 70% of the available person-years.

Figure VIII Total Expenditures and Personnel, by Major Science Departments, 1988-89

Department or agency	Total intramural expenditures	Departmental personnel	Extramural payments
	($'000)	person-years	($'000)
Agriculture	14,830	425	5,946
Environmental Center	10,143	231	983
Forestry, Lands and Wildlife	15,407	320	6,685
AOSTRA	8,009	48	24,948
Technology, Research and Telecommunications	482	9	52,518
Transportation and Utilities	8,480	177	1,179
Other	29,623	647	55,211
**TOTAL	**86,974**	**1,857**	**147,470**

All Sciences

TABLE 1. Total Expenditures by Activity, 1982-83 to 1989-90

Activity	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Research and development								
Current expenditures:								
In-house	14,751	15,785	15,514	16,577	20,832	13,854	19,849	19,529
Contracts	51,969	46,658	84,980	56,102	88,099	41,598	29,386	43,222
Grants	62,699	80,923	83,575	104,811	141,860	108,313	94,012	88,341
Research fellowships	306	503	533	453	433	958	150	3,609
Administration of extramural R&D programs	...	...	...	...	...	7,451	8,521	5,505
Sub-total	129,725	143,869	184,602	177,943	251,224	172,174	151,918	160,206
Capital expenditures	8,030	11,411	2,398	1,174	698	522	705	745
Related scientific activities								
Current expenditures	69,138	75,539	78,141	86,686	77,987	66,893	77,022	68,708
Administration of extramural RSA programs	...	...	...	...	...	563	937	1,015
Sub-total	69,138	75,539	78,141	86,686	77,987	67,456	77,959	69,723
Capital expenditures	5,935	8,049	11,573	6,575	3,518	2,759	3,862	2,370
TOTAL	**212,828**	**238,868**	**276,714**	**272,378**	**333,427**	**242,911**	**234,444**	**233,044**

TABLE 2. Total Expenditures by Department or Agency, 1982-83 to 1989-90

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Advanced Education	...	1,354	1,639	2,150	1,783	1,561	2,176	2,611
Advanced Education & Manpower	2,612	...	...	...	...	...	...	...
Agricultural Research Trust	373	369	414	391	410	467	...	...
Agriculture	16,391	19,532	19,272	19,787	17,153	17,626	20,776	21,077
Alcoholism & Drug Abuse Commission	264	320	308	524	584	396	577	790
Attorney General	290	436	407	363	363	326	300	300
Career Development & Employment	...	...	...	...	1,863	1,716	1,588	1,557
Community & Occupational Health	...	...	...	...	986	1,510	...	...
Consumer & Corporate Affairs	143	172	157	154	174	191	98	115
Culture & Multiculturalism[3]	17,058	22,313	26,628	21,689	19,598	7,433	4,799	3,055
Economic Development	4,093	3,374	3,180	4,418	...	...	...	...
Economic Development & Trade	...	...	...	...	5,740	5,391	3,478	4,058
Education	3,617e	2,724	3,019	3,068	2,507	1,728	2,139	2,250
Educational Communications Corporation ACCESS	200e	398	350	350	350	385	367	112
Energy	...	...	...	...	7,917	6,248	4,527	10,222
Energy & Natural Resources	25,210	28,509	19,622	15,197	...	...	...	...
Environment	9,687	13,109	15,344	16,748	16,484	14,590	6,556	5,297
Environmental Centre	10,528	11,605	11,330	12,286	11,712	11,076	11,126	11,271
Environment Council	1,243	1,525	1,176	1,060	1,245	1,016	939	864
Executive Council	19,148	19,950	21,463	26,209	...	...	...	...
Family & Social Services	...	...	...	...	421	579	629	607
Forestry, Lands & Wildlife	...	...	...	...	8,760	6,715	22,092	21,451
Health	...	...	...	...	...	...	5,788	6,347
Alberta Heritage Foundation for Medical Research[1]	21,588	27,562	32,748	43,878	56,930	51,167	37,623	34,792
Hospitals & Medical Care[1]	19,502	22,253	20,205	23,621	24,690	4,690	...	...
Housing & Public Works	...	...	...	...	...	...	...	...
Housing	805	1,206	1,735	2,401	...	...	...	...
Labour	1,105	1,047	1,067	1,239	1,242	1,132	1,339	1,279
Manpower[2]	...	1,539	1,412	1,999	...	...	...	...
Mental Health Research Fund	386	754	729	873	700	624	...	...
Municipal Affairs	1,408	1,577	1,037	870	3,544	3,583	3,922	3,983
AOSTRA	41,105	40,639	77,132	52,808	78,917	36,299	32,957	37,952
Occupational Health & Safety	...	...	...	...	...	...	567	1,197
Recreation & Parks	940	535	882	515	431	488	1,044	501
Social Services & Community Health	400	463	507	5,481	...	...	...	...
Solicitor General	3,478	4,434	4,521	2,234	1,617	1,892	2,526	2,289
Technology, Research & Telecommunications	...	...	...	...	55,092	51,297	53,000	45,058
Tourism	...	...	...	...	637	759	1,920	1,869
Tourism & Small Business	1,597	1,058	713	882	...	...	...	...
Transportation & Utilities	6,816	6,892	6,460	7,479	9,310	10,017	9,659	9,952
Treasury	1,994	2,097	2,094	2,172	2,267	2,009	1,932	2,188
Workers' Health, Safety & Compensation	847	1,122	1,163	1,532	...	...	...	...
TOTAL	**212,828**	**238,868**	**276,714**	**272,378**	**333,427**	**242,911**	**234,444**	**233,044**

1 Grants to hospitals for Applied Heart Research not included in departemental budget as of 1987-88.

2 Included with Department of Health as of 1988-89.

3 Values reported for the department of Culture and Multiculturalism are currently being reviewed due to reporting changes. Revisions will be incorporated in the 1989-90 survey report.

TABLE 3. Total Expenditures by Performer, 1982-83 to 1988-90

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Intramural	79,999	93,257	92,106	89,309	87,541	79,541	86,974	82,240
Industry	44,502	42,623	78,256	57,643	91,306	50,688	49,078	57,252
Universities	39,242	41,827	45,776	58,824	91,183	69,535	54,796	50,477
Hospitals and health organizations	11,191	16,711	15,320	18,835	18,710	730	1,423	1,733
Alberta Research Council[1]	32,354	35,043	38,602	39,229	33,765	33,085	31,416	32,562
Other	5,540	9,407	6,654	8,538	10,922	9,332	10,757	8,780
TOTAL	**212,828**	**238,868**	**276,714**	**272,378**	**333,427**	**242,911**	**234,444**	**233,044**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 4. Total Expenditures on R&D by Performer, 1982-83 to 1989-90

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Intramural	22,834	27,411	18,277	18,156	22,313	21,997	29,338	26,401
Industry	32,579	32,207	68,697	44,442	82,912	44,087	34,892	47,783
Universities	36,842	39,975	43,508	55,451	89,463	68,250	48,313	46,614
Hospitals and health organizations	11,191	16,646	15,244	18,825	18,710	730	1,383	1,733
Alberta Research Council[1]	31,184	33,370	37,297	38,127	31,021	31,941	29,943	31,509
Other	3,125	5,671	3,977	4,366	7,503	5,691	8,754	6,911
TOTAL	**137,755**	**155,280**	**187,000**	**179,367**	**251,922**	**172,696**	**152,623**	**160,951**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 5. Total Expenditures on R&D by Department or Agency, 1982-83 to 1989-90

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Advanced Education	...	19	65	488	462	472	238	173
Agricultural Research Trust	373	369	414	391	410	467	...	...
Agriculture	13,699	15,782	11,937	12,471	10,153	9,820	13,315	13,410
Alcoholism & Drug Abuse Commission	7	1	1	-	-	-	-	84
Attorney General	290	436	407	363	363	326	300	300
Career Development & Employment	...	...	...	...	-	-	19	-
Community & Occupational Health	...	...	...	...	234	818	...	...
Culture & Multiculturalism	296	773	1,464	1,464	4,211	-	2,506	2,272
Education	295e	302	324	526	1,376	753	471	319
Educational Communications Corporation ACCESS	7e	-	31	31	31	-	-	-
Energy	...	...	...	...	7,235	5,461	4,409	9,828
Energy & Natural Resources	16,412	20,318	12,776	7,618	...	...	...	...
Environment	3,558	3,949	4,467	4,949	5,159	4,033	821	655
Environmental Centre	4,007	4,399	4,369	4,947	5,373	5,103	5,670	5,516
Executive Council	19,148	19,950	21,463	26,209	...	...	...	...
Family & Social Services	...	...	...	...	20	190	367	367
Forestry, Lands & Wildlife	...	...	...	...	3,244	3,079	3,972	3,606
Health	...	...	...	...	...	...	3,094	3,761
Alberta Heritage Foundation for Medical Research[1]	20,659	26,656	31,901	43,007	56,475	50,919	37,365	34,392
Hospitals & Medical Care	16,976	19,880	17,836	21,232	22,191	2,285	...	...
Housing	385	370	775	958	...	...	...	...
Manpower[2]	...	90	-	-	...	...	...	...
Mental Health Research Fund	386	754	729	873	700	624	...	...
Municipal Affairs	68	53	-	-	1,088	1,025	641	1,023
AOSTRA	41,105	40,639	77,132	52,808	78,917	36,299	30,235	37,952
Occupational Health & Safety	...	...	...	...	...	...	175	780
Recreation & Parks	-	27	-	-	-	-	25	50
Technology, Research & Telecommunications	...	...	...	...	52,854	49,329	45,509	43,344
Tourism	...	...	...	...	-	48	1,745	1,209
Transportation & Utilities	13	66	762	642	1,426	1,645	1,746	1,810
Treasury	-	-	-	-	-	-	-	-
Workers' Health, Safety & Compensation	71	447	147	390	...	...	...	...
TOTAL	**137,755**	**155,280**	**137,000**	**179,367**	**251,922**	**172,696**	**152,623**	**160,951**

1 Grants to hospitals for Applied Heart Research not included in departemental budget after 1987-88.

2 Included with Department of Health as of 1988-89.

TABLE 6. Departmental Personnel Engaged in Scientific Activities by Activity and Category, 1982-83 to 1989-90

Activity and category	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	(person-years)							
Research & development:								
Scientific & professional	174	175	190	207	224	136	171	195
Technical	132	137	148	145	159	162	185	180
Other	53	57	68	66	70	45	68	71
Sub-total	359	369	406	418	453	343	424	446
Related scientific activities:								
Scientific & professional	451	595	728	721	630	540	485	487
Technical	286	432	624	589	529	531	624	621
Other	187	206	264	249	232	212	196	187
Sub-total	924	1,233	1,616	1,559	1,391	1,283	1,305	1,295
Administration of extramural programs:								
Scientific & professional	...	...	...	...	...	67	53	42
Technical	...	...	...	...	...	6	17	18
Other	...	...	...	...	...	56	58	50
Sub-total	...	...	...	...	...	129	128	110
Total scientific activities:								
Scientific & professional	625	770	918	928	854	743	709	724
Technical	418	569	772	734	688	699	826	819
Other	240	263	332	315	302	313	322	308
**TOTAL	**1,283**	**1,602**	**2,022**	**1,977**	**1,844**	**1,755**	**1,857**	**1,851**

Chart 2.

Departmental Personnel Engaged in Scientific Activities, by Type of Activity, 1982–83 to 1989–90(e)

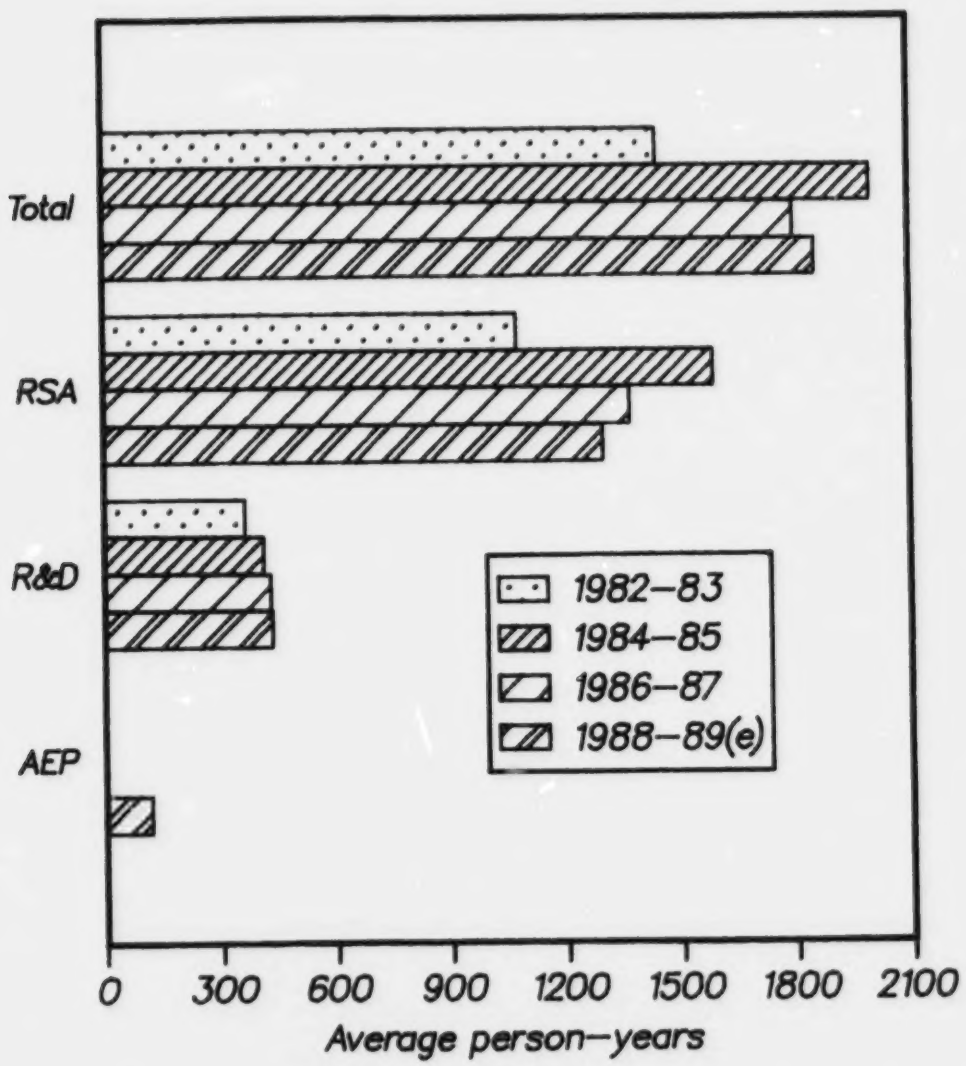
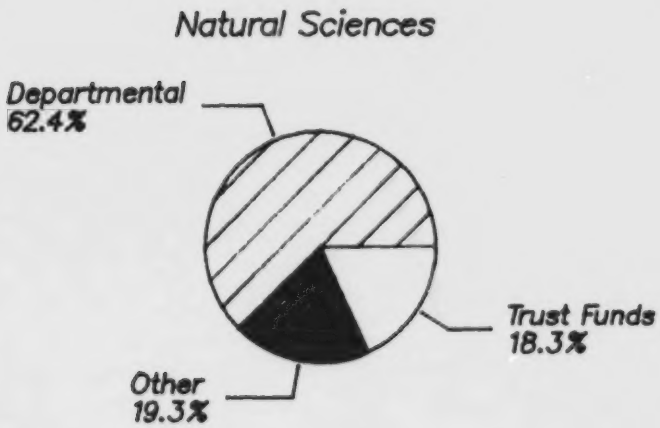


TABLE 7. Total Expenditures by Sources of Funds, 1988-89

Department or agency	Departmental budget	Other departments	Federal government	Trust funds	Other sources	Total
	($'000)					
Advanced Education	2,176	-	-	-	-	2,176
Agriculture	15,776	-	-	5,000	-	20,776
Alcoholism & Drug Abuse Commission	577	-	-	-	-	577
Attorney General	300	-	-	-	-	300
Career Development & Employment	1,588	-	-	-	-	1,588
Consumer & Corporate Affairs	98	-	-	-	-	98
Culture & Multiculturalism	4,189	-	610	-	-	4,799
Economic Development & Trade	3,441	-	-	37	-	3,478
Education	2,139	-	-	-	-	2,139
Educational Communications Corporation ACCESS	367	-	-	-	-	367
Energy	4,527	-	-	-	-	4,527
Environment	6,272	-	-	284	-	6,556
Environmental Centre	10,706	-	45	-	375	11,126
Environment Council	939	-	-	-	-	939
Family & Social Services	629	-	-	-	-	629
Forestry, Lands & Wildlife	21,051	-	864	177	-	22,092
Health	3,328	-	63	2,397	-	5,788
Alberta Heritage Foundation for Medical Research	-	-	-	-	37,623	37,623
Labour	1,339	-	-	-	-	1,339
Municipal Affairs	3,922	-	-	-	-	3,922
AOSTRA	3,400	-	-	29,557	-	32,957
Occupational Health & Safety	196	-	-	175	196	567
Recreation & Parks	979	-	-	-	65	1,044
Solicitor General	2,526	-	-	-	-	2,526
Technology, Research & Telecommunications	53,000	-	-	-	-	53,000
Tourism	1,048	-	872	-	-	1,920
Transportation & Utilities	9,659	-	-	-	-	9,659
Treasury	1,932	-	-	-	-	1,932
TOTAL	**156,104**	**-**	**2,454**	**37,627**	**38,259**	**234,444**

Chart 3.

Total Expenditures on Scientific Activities, by Source of Funds and Science Type, 1988–89



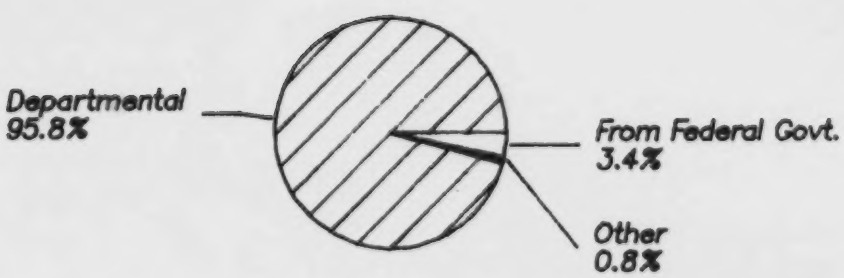


TABLE 8. Total Expenditures by Activity and Performer, 1988-89

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Research and development							
Current expenditures:							
In-house	19,849	...	...	...	...	...	19,849
Contracts	263	18,899	2,840	-	5,380	2,004	29,386
Grants	...	15,993	45,473	1,383	24,413	6,750	94,012
Research fellowships	-	-	-	-	150	-	150
Administration of extramural R&D programs	8,521	...	...	...	...	...	8,521
Sub-total	28,633	34,892	48,313	1,383	29,943	8,754	151,918
Capital expenditures	705	...	...	...	...	...	705
Related scientific activities							
Current expenditures	52,837	14,186	6,483	40	1,473	2,003	77,022
Administration of extramural RSA programs	937	...	...	...	...	...	937
Sub-total	53,774	14,186	6,483	40	1,473	2,003	77,959
Capital expenditures	3,862	...	...	...	...	...	3,862
TOTAL	**86,974**	**49,078**	**54,796**	**1,423**	**31,416**	**10,757**	**234,444**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

Chart 4.

Total Expenditures on Scientific Activities, by Sector of Performance and Science Type, 1988–89

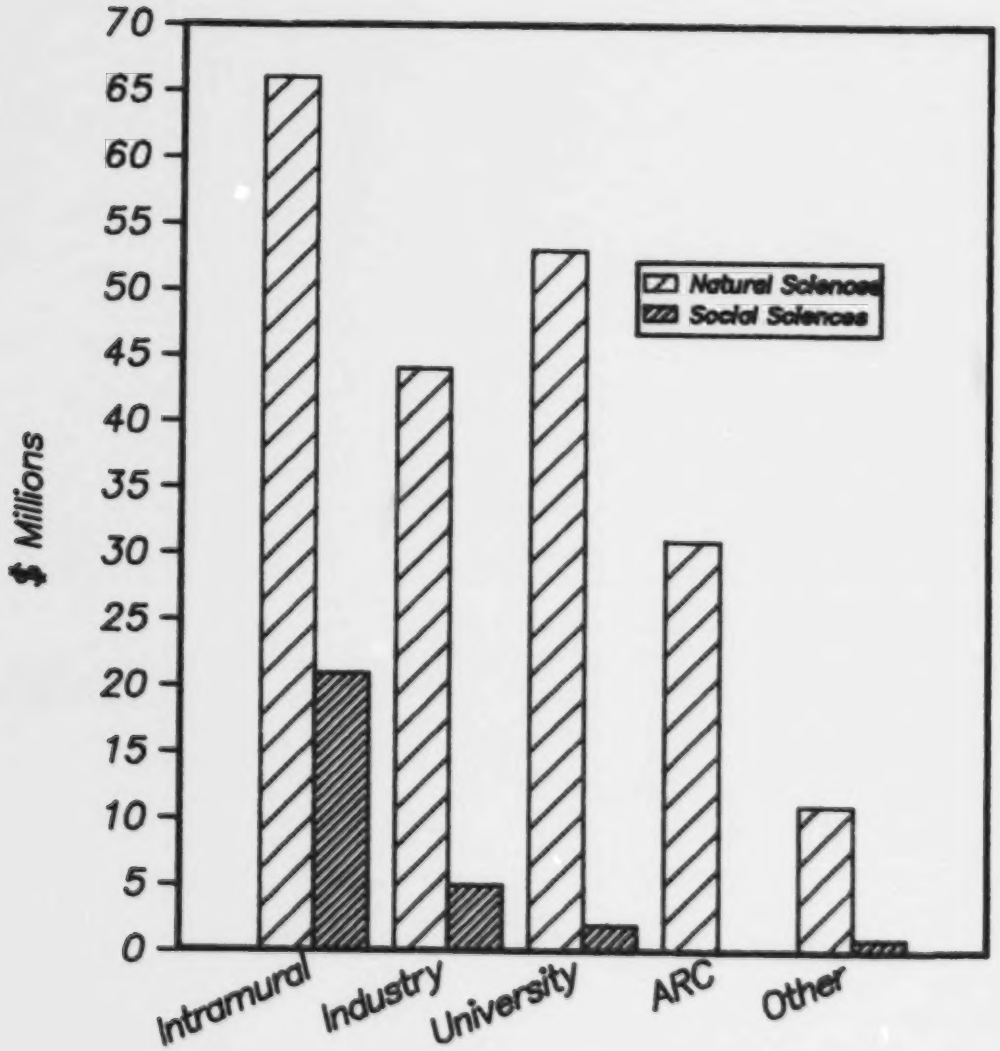


TABLE 9. Total Expenditures by Department or Agency and Performer, 1988-89

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Advanced Education	492	-	1,494	-	-	190	2,176
Agriculture	14,830	1,112	2,330	-	723	1,781	20,776
Alcoholism & Drug Abuse Commission	577	-	-	-	-	-	577
Attorney General	-	-	-	-	-	300	300
Career Development & Employment	1,132	182	29	-	-	245	1,588
Consumer & Corporate Affairs	75	6	12	-	-	5	98
Culture & Multiculturalism .	4,559	192	22	-	-	26	4,799
Economic Development & Trade	2,490	930	20	-	-	38	3,478
Education	1,370	258	190	-	5	316	2,139
Educational Communications Corporation ACCESS	367	-	-	-	-	-	367
Energy	916	2,246	399	-	727	239	4,527
Environment	3,749	1,596	30	-	174	1,007	6,556
Environmental Centre	10,143	800	103	-	75	5	11,126
Environment Council	939	-	-	-	-	-	939
Family & Social Services ...	417	80	-	-	-	132	629
Forestry, Lands & Wildlife .	15,407	5,421	314	-	822	128	22,092
Health	2,414	438	1,311	1,383	179	63	5,788
Alberta Heritage Foundation for Medical Research	1,376	-	33,313	-	-	2,934	37,623
Labour	918	421	-	-	-	-	1,339
Municipal Affairs	3,263	532	-	-	-	127	3,922
AOSTRA	8,009	15,964	3,535	-	4,714	735	32,957
Occupational Health & Safety	384	30	153	-	-	-	567
Recreation & Parks	624	316	92	-	-	12	1,044
Solicitor General	1,577	949	-	-	-	-	2,526
Technology, Research & Telecommunications	482	15,504	11,301	40	23,650	2,023	53,000
Tourism	378	1,542	-	-	-	-	1,920
Transportation & Utilities .	8,480	233	148	-	347	451	9,659
Treasury	1,606	326	-	-	-	-	1,932
**TOTAL	**86,974**	**49,078**	**54,796**	**1,423**	**31,416**	**10,757**	**234,444**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 10. Total Expenditures by Department or Agency and Activity, 1988-89

Department or agency	Research and development			Related scientific activities			Total
	Current	AEP[1]	Capital	Current	AEP[1]	Capital	
	($'000)						
Advanced Education	237	1	-	1,929	9	-	2,176
Agriculture	11,725	1,590	-	7,461	-	-	20,776
Alcoholism & Drug Abuse Commission	-	-	-	577	-	-	577
Attorney General	300	-	-	-	-	-	300
Career Development & Employment	19	-	-	1,569	-	-	1,588
Consumer & Corporate Affairs	-	-	-	98	-	-	98
Culture & Multiculturalism	2,228	-	278	768	-	1,525	4,799
Economic Development & Trade	-	-	-	3,413	20	45	3,478
Education	392	75	4	1,377	275	16	2,139
Educational Communications Corporation ACCESS	-	-	-	350	-	17	367
Energy	3,539	855	15	118	-	-	4,527
Environment	773	48	-	5,536	138	61	6,556
Environmental Centre	5,358	94	218	5,271	-	185	11,126
Environment Council	-	-	-	939	-	-	939
Family & Social Services	367	-	-	262	-	-	629
Forestry, Lands & Wildlife	3,733	164	75	17,160	255	705	22,092
Health	3,080	14	-	2,611	65	18	5,788
Alberta Heritage Foundation for Medical Research	35,989	1,376	-	258	-	-	37,623
Labour	-	-	-	1,339	-	-	1,339
Municipal Affairs	282	359	-	3,160	121	-	3,922
AOSTRA	26,530	3,688	17	2,722	-	-	32,957
Occupational Health & Safety	153	22	-	386	-	6	567
Recreation & Parks	25	-	-	1,013	6	-	1,044
Solicitor General	-	-	-	2,526	-	-	2,526
Technology, Research & Telecommunications	45,364	145	-	7,491	-	-	53,000
Tourism	1,745	-	-	162	13	-	1,920
Transportation & Utilities	1,558	90	98	6,625	35	1,253	9,659
Treasury	-	-	-	1,901	-	31	1,932
TOTAL	**143,397**	**8,521**	**705**	**77,022**	**937**	**3,862**	**234,444**

[1] Administration of extramural programs.

TABLE 11. Total Expenditures on R&D by Department or Agency and Performer, 1988-89

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Advanced Education	1	-	137	-	-	100	238
Agriculture	8,608	507	2,327	-	101	1,772	13,315
Attorney General	-	-	-	-	-	300	300
Career Development & Employment	-	19	-	-	-	-	19
Culture & Multiculturalism ..	2,395	111	-	-	-	-	2,506
Education	299	6	42	-	5	119	471
Energy	870	2,211	399	-	727	202	4,409
Environment	185	446	20	-	165	5	821
Environmental Centre	4,687	800	103	-	75	5	5,670
Family & Social Services	287	80	-	-	-	-	367
Forestry, Lands & Wildlife ..	1,712	1,118	314	-	700	128	3,972
Health	269	-	1,263	1,383	179	-	3,094
Alberta Heritage Foundation for Medical Research	1,376	-	33,069	-	-	2,920	37,365
Municipal Affairs	359	282	-	-	-	-	641
AOSTRA	7,088	15,108	3,310	-	3,994	735	30,235
Occupational Health & Safety	22	-	153	-	-	-	175
Recreation & Parks	25	-	-	-	-	-	25
Technology, Research & Telecommunications	145	12,669	7,028	-	23,650	2,017	45,509
Tourism	365	1,380	-	-	-	-	1,745
Transportation & Utilities ..	645	155	148	-	347	451	1,746
**TOTAL	**29,338**	**34,892**	**48,313**	**1,383**	**29,943**	**8,754**	**152,623**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 12. Intramural Expenditures by Department or Agency and Type of Expenditure, 1988-89

Department or agency	Current expenditures		Capital expenditures	Total
	Personnel costs	Other costs		
	($'000)			
Advanced Education	436	56	-	492
Agriculture	9,834	4,996	-	14,830
Alcoholism & Drug Abuse Commission	283	294	-	577
Attorney General	-	-	-	-
Career Development & Employment	1,087	45	-	1,132
Consumer & Corporate Affairs	65	10	-	75
Culture & Multiculturalism	2,262	494	1,803	4,559
Economic Development & Trade	2,032	413	45	2,490
Education	1,077	273	20	1,370
Educational Communications Corporation ACCESS	238	112	17	367
Energy	861	40	15	916
Environment	2,968	720	61	3,749
Environmental Centre	7,672	2,068	403	10,143
Environment Council	779	160	-	939
Family & Social Services	299	118	-	417
Forestry, Lands & Wildlife	10,867	3,760	780	15,407
Health	1,584	812	18	2,414
Alberta Heritage Foundation for Medical	546	830	-	1,376
Labour	806	112	-	918
Municipal Affairs	2,633	630	-	3,263
AOSTRA	6,054	1,938	17	8,009
Occupational Health & Safety	346	32	6	384
Recreation & Parks	565	59	-	624
Solicitor General	1,577	-	-	1,577
Technology, Recreation & Telecommunications	333	149	-	482
Tourism	378	-	-	378
Transportation & Utilities	5,621	1,508	1,351	8,480
Treasury	1,342	233	31	1,606
TOTAL	**62,545**	**19,862**	**4,567**	**86,974**

TABLE 13. Departmental Personnel Engaged in Scientific Activities, 1988-89

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Advanced Education	-	-	-	-	8	-	3	11
Agriculture	59	83	-	142	115	156	-	271
Alcoholism & Drug Abuse Commission	-	-	-	-	7	2	1	10
Attorney General	-	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	17	4	5	26
Consumer & Corporate Affairs	-	-	-	-	-	2	-	2
Culture & Multiculturalism	21	33	21	75	20	32	22	74
Economic Development & Trade	-	-	-	-	36	2	9	47
Education	2	-	-	2	9	3	3	15
Educational Communications Corporation ACCESS	-	-	-	-	3	1	1	5
Energy	-	-	-	-	1	-	1	2
Environment	1	1	-	2	17	38	2	57
Environmental Centre	26	51	21	98	37	63	30	130
Environment Council	-	-	-	-	10	3	7	20
Family & Social Services	5	-	-	5	3	1	-	4
Forestry, Lands & Wildlife	25	10	10	45	30	183	23	236
Health	5	1	1	7	21	4	10	35
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-
Labour	-	-	-	-	12	1	8	21
Municipal Affairs	4	-	-	4	42	9	10	61
AOSTRA	11	-	9	20	3	-	3	6
Occupational Health & Safety	-	-	-	-	5	-	2	7
Recreation & Parks	-	-	-	-	13	4	-	17
Solicitor General	-	-	-	-	10	34	-	44
Technology, Research & Telecommunications	-	-	-	-	6	-	-	6
Tourism	7	3	3	13	-	-	-	-
Transportation & Utilities	5	3	3	11	34	80	49	163
Treasury	-	-	-	-	26	2	7	35
TOTAL	**171**	**185**	**68**	**424**	**485**	**624**	**196**	**1,305**

TABLE 13. Departmental Personnel Engaged in Scientific Activities, 1988-89 - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Advanced Education	-	-	-	-	8	-	3	11
Agriculture	2	2	8	12	176	241	8	425
Alcoholism & Drug Abuse Commission	-	-	-	-	7	2	1	10
Attorney General	-	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	17	4	5	26
Consumer & Corporate Affairs	-	-	-	-	-	2	-	2
Culture & Multiculturalism	-	-	-	-	41	65	43	149
Economic Development & Trade	-	-	1	1	36	2	10	48
Education	5	1	1	7	16	4	4	24
Educational Communications Corporation ACCESS	-	-	-	-	3	1	1	5
Energy	6	-	5	11	7	-	6	13
Environment	3	-	1	4	21	39	3	63
Environmental Centre	2	-	1	3	65	114	52	231
Environment Council	-	-	-	-	10	3	7	20
Family & Social Services	-	-	-	-	8	1	-	9
Forestry, Lands & Wildlife	10	13	16	39	65	206	49	320
Health	1	-	-	1	27	5	11	43
Alberta Heritage Foundation for Medical Research	4	-	11	15	4	-	11	15
Labour	-	-	-	-	12	1	8	21
Municipal Affairs	1	-	4	5	47	9	14	70
AOSTRA	12	-	10	22	26	-	22	48
Occupational Health & Safety	1	-	-	1	6	-	2	8
Recreation & Parks	-	-	-	-	13	4	-	17
Solicitor General	-	-	-	-	10	34	-	44
Technology, Research & Telecommunications	3	-	-	3	9	-	-	9
Tourism	1	-	-	1	8	3	3	14
Transportation & Utilities	2	1	-	3	41	84	52	177
Treasury	-	-	-	-	26	2	7	35
TOTAL	**53**	**17**	**58**	**128**	**709**	**826**	**322**	**1,857**

Chart 5.

Departmental Personnel Engaged in Scientific Activities, by Category and Science Type, 1988–89

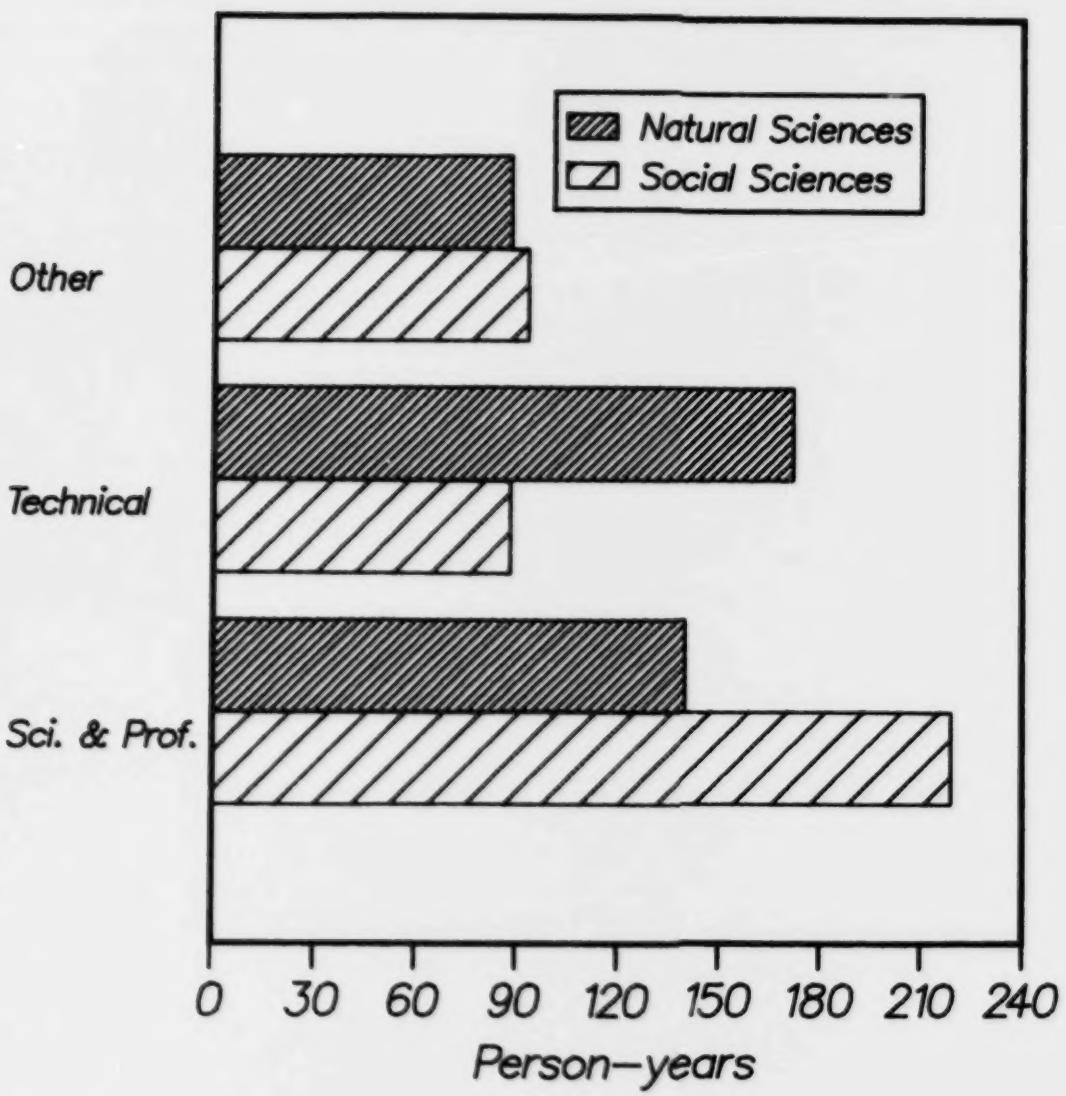


TABLE 14. Objectives of Expenditures by Department or Agency, 1988-89

Department or agency	Advancement of science	Energy and fuels				Environmental issues			
		Conservation	Fossil fuels	Renewable resources	Other	Air	Land	Water	Other
	($'000)								
Advanced Education	100	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-
Alcoholism & Drug Abuse Commission	-	-	-	-	-	-	-	-	-
Attorney General	-	-	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	-	-	-	-	-
Consumer & Corporate Affairs	-	-	-	-	-	-	-	-	-
Culture & Multiculturalism	-	-	-	-	-	-	-	-	-
Economic Development & Trade	-	-	-	-	-	-	-	-	-
Education	-	-	-	-	-	-	31	-	-
Educational Communications Corporation ACCESS	-	-	-	-	-	-	-	-	-
Energy	-	148	4,307	72	-	-	-	-	-
Environment	75	5	-	-	5	521	342	1,748	678
Environmental Centre	-	-	140	-	-	908	222	1,595	-
Environment Council	-	-	-	-	-	-	-	-	939
Family & Social Services	-	-	-	-	-	-	-	-	-
Forestry, Lands & Wildlife	2	-	-	44	-	-	84	-	-
Health	-	-	-	-	-	13	-	-	-
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	-
Labour	-	-	-	-	-	-	-	-	-
Municipal Affairs	-	-	-	-	1,057	-	-	-	-
AOSTRA	-	-	32,957	-	-	-	-	-	-
Occupational Health & Safety	-	-	-	-	-	-	-	-	-
Recreation & Parks	-	-	-	-	-	-	-	40	142
Solicitor General	-	-	-	-	-	-	-	-	-
Technology, Research & Telecommunications	-	-	-	-	-	-	-	-	-
Tourism									
Transportation & Utilities	-	-	-	-	-	-	-	-	-
Treasury	-	-	-	-	-	-	-	-	-
TOTAL	**177**	**153**	**37,404**	**116**	**1,062**	**1,442**	**679**	**3,383**	**1,759**

TABLE 14. Objectives of Expenditures by Department or Agency, 1988-89 - Continued

Department or agency	Health	Industrial and economic development					
		Agriculture	Fisheries	Forestry	Manufacturing	Minerals	Other
	($'000)						
Advanced Education	-	-	-	-	-	-	-
Agriculture	-	20,776	-	-	-	-	-
Alcoholism & Drug Abuse Commission	577	-	-	-	-	-	-
Attorney General	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	-	-	-
Consumer & Corporate Affairs	-	-	-	-	-	-	-
Culture & Multiculturalism	-	-	-	-	-	-	-
Economic Development & Trade	-	-	-	-	36	582	1,763
Education	-	-	-	-	-	-	-
Educational Communications Corporation ACCESS	-	-	-	-	-	-	-
Energy	-	-	-	-	-	-	-
Environment	-	492	5	-	-	-	2,078
Environmental Centre	3,394	2,679	140	140	-	-	328
Environment Council	-	-	-	-	-	-	-
Family & Social Services	-	-	-	-	-	-	-
Forestry, Lands & Wildlife	-	-	270	3,926	-	-	-
Health	5,727	-	-	-	-	-	-
Alberta Heritage Foundation for Medical Research	37,623	-	-	-	-	-	-
Labour	-	-	-	-	-	-	298
Municipal Affairs	-	-	-	-	-	-	-
AOSTRA	-	-	-	-	-	-	-
Occupational Health & Safety	567	-	-	-	-	-	
Recreation & Parks	12	-	-	-	-	-	-
Solicitor General	-	-	-	-	-	-	-
Technology, Research & Telecommunications	-	-	-	-	53,000	-	-
Tourism	-	-	-	-	-	-	-
Transportation & Utilities	-	-	-	-	-	-	-
Treasury	-	-	-	-	-	-	-
TOTAL	**47,900**	**23,947**	**415**	**4,066**	**53,036**	**582**	**4,467**

TABLE 14. Objectives of Expenditures by Department or Agency, 1988-89 - Concluded

Department or agency	Social development					Transportation	Wildlife	Other	Total
	Culture, sport and recreation	Education	Human resources	Urban and regional studies	Other				
	($'000)								
Advanced Education	-	1,939	-	137	-	-	-	-	2,176
Agriculture	-	-	-	-	-	-	-	-	20,776
Alcoholism & Drug Abuse Commission	-	-	-	-	-	-	-	-	577
Attorney General	-	-	-	-	300	-	-	-	300
Career Development & Employment	-	1,588	-	-	-	-	-	-	1,588
Consumer & Corporate Affairs	-	-	-	-	98	-	-	-	98
Culture & Multiculturalism	4,799	-	-	-	-	-	-	-	4,799
Economic Development & Trade	79	-	-	-	-	987	-	-	3,478
Education	-	2,139	-	-	-	-	-	-	2,139
Educational Communications Corporation ACCESS	-	367	-	-	-	-	-	-	367
Energy	-	-	-	-	-	-	-	-	4,527
Environment	6	2	-	7	-	-	11	580	6,556
Environmental Centre	786	-	-	-	-	-	794	-	11,126
Environment Council	-	-	-	-	-	-	-	-	939
Family & Social Services	-	110	250	-	269	-	-	-	629
Forestry, Lands & Wildlife	-	-	-	-	15,800	-	1,966	-	22,092
Health	-	48	-	-	-	-	-	-	5,788
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	37,623
Labour	-	-	927	-	114	-	-	-	1,339
Municipal Affairs	-	-	-	2,472	393	-	-	-	3,922
AOSTRA	-	-	-	-	-	-	-	-	32,957
Occupational Health & Safety	-	-	-	-	-	-	-	-	567
Recreation & Parks	825	-	-	-	-	-	25	-	1,044
Solicitor General	-	-	-	-	2,526	-	-	-	2,526
Technology, Research & Telecommunications	-	-	-	-	-	-	-	-	53,000
Tourism	-	-	-	-	1,920	-	-	-	1,920
Transportation & Utilities	-	-	-	-	-	9,659	-	-	9,659
Treasury	-	-	-	-	1,932	-	-	-	1,932
TOTAL	**6,495**	**6,193**	**1,177**	**2,616**	**23,352**	**10,646**	**2,797**	**580**	**234,444**

TABLE 15. Objectives of Expenditures by Activity, 1988-89

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	($'000)				
Advancement of science	-	-	177	-	177
Energy and fuels:					
Conservation	85	5	63	-	153
Fossil fuels	8,013	967	26,623	1,801	37,404
Renewable resources	-	44	-	72	116
Other	359	185	282	236	1,062
Environmental issues:					
Air	321	801	232	88	1,442
Land	145	119	323	92	679
Water	258	2,235	540	350	3,383
Other	50	1,054	173	482	1,759
Health	2,505	5,358	39,248	789	47,900
Industrial and economic development:					
Agriculture	9,682	7,892	4,712	1,661	23,947
Fisheries	259	109	-	47	415
Forestry	949	502	1,867	748	4,066
Manufacturing	145	337	45,364	7,190	53,036
Minerals	-	300	-	282	582
Other	328	2,920	-	1,219	4,467
Social development:					
Culture, sport and recreation	3,003	2,890	111	491	6,495
Education	300	3,063	191	2,639	6,193
Human resources	80	710	80	307	1,177
Urban and regional studies	-	2,346	137	133	2,616
Other	1,072	15,686	1,980	4,614	23,352
Transportation	645	8,612	1,101	288	10,646
Wildlife	1,104	1,041	41	611	2,797
Other	35	460	40	45	580
**TOTAL	**29,338**	**57,636**	**123,285**	**24,185**	**234,444**

Chart 6.

Objectives of Total Expenditures on Scientific Activities, by Science Type, 1988–89

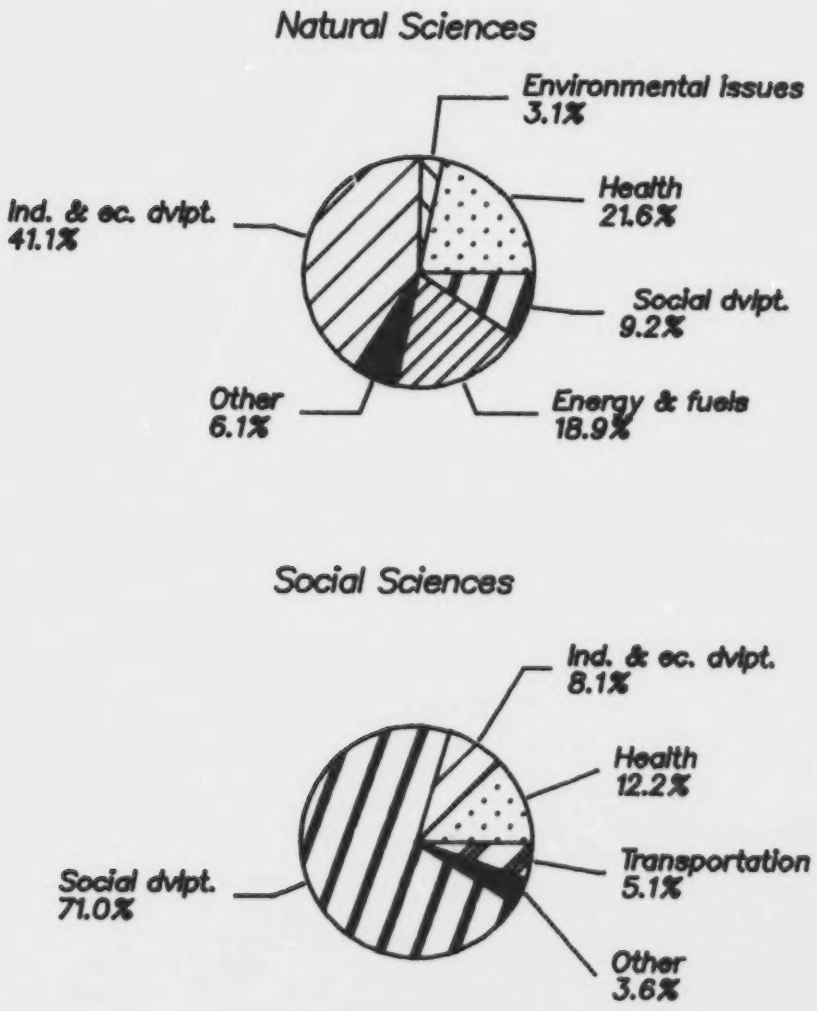


TABLE 16. Total Expenditures by Activity and Performer, 1989-90e

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Research and development							
Current expenditures:							
In-house	19,529	...	...	...	...	...	19,529
Contracts	622	28,371	5,473	-	5,500	3,256	43,222
Grants	...	19,412	39,567	-	25,707	3,655	88,341
Research fellowships	-	-	1,574	1,733	302	-	3,609
Admistration of extramural R&D programs	5,505	...	...	...	...	...	5,505
Sub-total	25,656	47,783	46,614	1,733	31,509	6,911	160,206
Capital expenditures	745	...	...	...	...	...	745
Related scientific activities							
Current expenditures	52,454	9,469	3,863	-	1,053	1,869	68,708
Administration of extramural RSA programs	1,015	...	...	...	...	...	1,015
Sub-total	53,469	9,469	3,863	-	1,053	1,869	69,723
Capital expenditures	2,370	...	...	...	...	...	2,370
**TOTAL	82,240	57,252	50,477	1,733	32,562	8,780	233,044**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 17. Total Expenditures by Department or Agency and Performer, 1989-90e

Department or agency	Intramural	Industry	Hospitals Universities organizations	Alberta and health Council[1]	Research	Other	Total
	($'000)						
Advanced Education	450	-	2,061	-	-	100	2,611
Agriculture	15,200	1,105	2,403	-	660	1,709	21,077
Alcoholism & Drug Abuse Commission	790	-	-	-	-	-	790
Attorney General	-	-	-	-	-	300	300
Career Development & Employment	1,145	176	-	-	-	236	1,557
Consumer & Corporate Affairs	95	20	-	-	-	-	115
Culture & Multiculturalism	2,811	195	22	-	-	27	3,055
Economic Development & Trade	2,783	1,205	20	-	-	50	4,058
Education	1,486	145	175	-	5	439	2,250
Educational Communications Corporation ACCESS	112	-	-	-	-	-	112
Energy	1,101	7,291	79	-	1,621	130	10,222
Environment	3,569	469	20	-	249	990	5,297
Environmental Centre	10,371	800	10	-	90	-	11,271
Environment Council	864	-	-	-	-	-	864
Family & Social Services ...	397	80	-	-	-	130	607
Forestry, Lands & Wildlife .	15,379	5,141	261	-	550	120	21,451
Health	2,404	400	1,602	1,733	182	26	6,347
Alberta Heritage Foundation for Medical Research	1,513	-	30,666	-	-	2,613	34,792
Labour	1,064	215	-	-	-	-	1,279
Municipal Affairs	3,205	678	75	-	-	25	3,983
AOSTRA	3,452	25,590	3,250	-	4,260	1,400	37,952
Occupational Health & Safety	462	35	700	-	-	-	1,197
Recreation & Parks	312	139	25	-	-	25	501
Solicitor General	1,626	663	-	-	-	-	2,289
Technology, Research & Telecommunications	380	11,165	8,943	-	24,570	-	45,058
Tourism	610	1,259	-	-	-	-	1,869
Transportation & Utilities	8,802	150	165	-	375	460	9,952
Treasury	1,857	331	-	-	-	-	2,188
**TOTAL	**82,240**	**57,252**	**50,477**	**1,733**	**32,562**	**8,780**	**233,044**

[1] Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 18. Total Expenditures by Department or Agency and Activity, 1989-90a

Department or agency	Research and development			Related scientific activities			Total
	Current	AEP[1]	Capital	Current	AEP[1]	Capital	
	($'000)						
Advanced Education	172	1	-	2,429	9	-	2,611
Agriculture	11,610	1,800	-	7,667	-	-	21,077
Alcoholism & Drug Abuse Commission	84	-	-	706	-	-	790
Attorney General	300	-	-	-	-	-	300
Career Development & Employment	-	-	-	1,557	-	-	1,557
Consumer & Corporate Affairs	-	-	-	115	-	-	115
Culture & Multiculturalism ...	2,272	-	-	783	-	-	3,055
Economic Development & Trade .	-	-	-	3,986	26	46	4,058
Education	267	50	2	1,626	300	5	2,250
Educational Communications Corporation ACCESS	-	-	-	112	-	-	112
Energy	8,727	1,079	22	394	-	-	10,222
Environment	576	79	-	4,496	96	50	5,297
Environmental Centre	5,155	60	301	5,415	-	340	11,271
Environment Council	-	-	-	864	-	-	864
Family & Social Services	367	-	-	240	-	-	607
Forestry, Lands & Wildlife ...	3,392	164	50	16,890	255	700	21,451
Health	3,746	15	-	2,557	29	-	6,347
Alberta Heritage Foundation for Medical Research	32,979	1,513	-	300	-	-	34,792
Labour	-	-	-	1,279	-	-	1,279
Municipal Affairs	348	435	240	2,715	245	-	3,983
AOSTRA	37,947	-	5	-	-	-	37,952
Occupational Health & Safety .	700	80	-	410	-	7	1,197
Recreation & Parks	50	-	-	451	-	-	501
Solicitor General	-	-	-	2,289	-	-	2,289
Technology, Research & Telecommunications	43,205	139	-	1,714	-	-	45,058
Tourism	1,209	-	-	635	25	-	1,869
Transportation & Utilities ...	1,595	90	125	6,975	30	1,137	9,952
Treasury	-	-	-	2,103	-	85	2,188
TOTAL	154,701	5,505	745	68,708	1,015	2,370	233,044

1 Administration of extramural programs.

TABLE 19. Total Expenditures on R&D by Department or Agency and Performer, 1989-90e

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Advanced Education	1	-	72	-	-	100	173
Agriculture	8,800	500	2,400	-	10	1,700	13,410
Alcoholism & Drug Abuse Commission	84	-	-	-	-	-	84
Attorney General	-	-	-	-	-	300	300
Culture & Multiculturalism	2,159	113	-	-	-	-	2,272
Education	202	25	38	-	5	49	319
Energy	1,101	7,291	79	-	1,227	130	9,828
Environment	84	320	10	-	240	1	655
Environmental Centre	4,616	800	10	-	90	-	5,516
Family & Social Services ...	287	80	-	-	-	-	367
Forestry Lands & Wildlife ..	1,656	1,019	261	-	550	120	3,606
Health	262	-	1,558	1,733	182	26	3.761
Alberta Heritage Foundation for Medical Research	1,513	-	30,379	-	-	2,600	34,492
Municipal Affairs	675	273	75	-	-	-	1,023
AOSTRA	3,452	25,590	3,250	-	4,260	1,400	37,952
Occupational Health & Safety	80	-	700	-	-	-	780
Recreation & Parks	-	-	25	-	-	25	50
Technology, Research & Telecommunications	139	11,043	7,592	-	24,570	-	43,344
Tourism	550	659	-	-	-	-	1,209
Transportation & Utilities .	740	70	165	-	375	460	1,810
**TOTAL	**26,401**	**47,783**	**46,614**	**1,733**	**31,509**	**6,911**	**160,951**

[1] Includes only annual funding by the Government of Alberta - other funds are not included.

Table 20. Departmental Personnel Engaged in Scientific Activities, 1989-90a

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Advanced Education	-	-	-	-	8	-	3	11
Agriculture	59	83	-	142	115	156	-	271
Alcoholism & Drug Abuse Commission	-	2	-	2	7	3	1	11
Attorney General	-	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	17	4	5	26
Consumer & Corporate Affairs	-	-	-	-	-	2	-	2
Culture & Multiculturalims	21	33	21	75	20	32	22	74
Economic Development & Trade	-	-	-	-	37	2	7	46
Education	2	-	-	2	8	3	3	14
Educational Communications Corporation ACCESS	-	-	-	-	1	1	-	2
Energy	-	-	-	-	-	-	-	-
Environment	-	1	-	1	19	38	3	60
Environmental Centre	26	45	22	93	37	61	32	130
Environment Council	-	-	-	-	10	3	7	20
Family & Social Services	4	-	-	4	3	1	-	4
Forestry, Lands & Wildlife	28	10	3	41	33	182	23	238
Health	6	1	-	7	28	3	10	41
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-
Labour	-	-	-	-	17	3	3	23
Municipal Affairs	5	-	-	5	44	6	9	59
AOSTRA	31	-	19	50	-	-	-	-
Occupational Health & Safety	-	-	-	-	5	-	2	7
Recreation & Parks	-	-	-	-	5	4	-	9
Solicitor General	-	-	-	-	10	34	-	44
Technology, Research & Telecommunications	-	-	-	-	2	-	-	2
Tourism	7	2	3	12	-	-	-	-
Transportation & Utilities	6	3	3	12	35	81	51	167
Treasury	-	-	-	-	26	2	6	34
TOTAL	**195**	**180**	**71**	**446**	**487**	**621**	**187**	**1,295**

TABLE 20. Departmental Personnel Engaged in Scientific Activities, 1989-90e - concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Advanced Education	-	-	-	-	8	-	3	11
Agriculture	2	2	8	12	176	241	8	425
Alcoholism & Drug Abuse Commission	-	-	-	-	7	5	1	13
Attorney General	-	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	17	4	5	26
Consumer & Corporate Affairs	-	-	-	-	-	2	-	2
Culture & Multiculturalism	-	-	-	-	41	65	43	149
Economic Development & Trade	-	-	-	-	37	2	7	46
Education	4	1	1	6	14	4	4	22
Educational Communications Corporation ACCESS	-	-	-	-	1	1	-	2
Energy	7	-	6	13	7	-	6	13
Environment	2	-	2	4	21	39	5	65
Environmental Centre	1	-	1	2	64	106	55	225
Environment Council	-	-	-	-	10	3	7	20
Family & Social Services	-	-	-	-	7	1	-	8
Forestry, Lands & Wildlife	10	13	16	39	71	205	42	318
Health	2	-	-	2	36	4	10	50
Alberta Heritage Foundation for Medical Research	4	-	11	15	4	-	11	15
Labour	-	-	-	-	17	3	3	23
Municipal Affairs	1	1	4	6	50	7	13	70
AOSTRA	-	-	-	-	31	-	19	50
Occupational Health & Safety	2	-	1	3	7	-	3	10
Recreation & Parks	-	-	-	-	5	4	-	9
Solicitor General	-	-	-	-	10	34	-	44
Technology, Research & Telecommunications	3	-	-	3	5	-	-	5
Tourism	2	-	-	2	9	2	3	14
Transportation & Utilities	2	1	-	3	43	85	54	182
Treasury	-	-	-	-	26	2	6	34
TOTAL	**42**	**18**	**50**	**110**	**724**	**819**	**308**	**1,851**

TABLE 21. Objectives of Expenditures by Department or Agency, 1989-90e

Department or agency	Advancement of science	Energy and fuels				Environmental issues			
		Conservation	Fossil fuels	Renewable resources	Other	Air	Land	Water	Other
	($'000)								
Advanced Education	100	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-
Alcoholism & Drug Abuse Commission	-	-	-	-	-	-	-	-	-
Attorney General	-	-	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	-	-	-	-	-
Consumer & Corporate Affairs	-	-	-	-	-	-	-	-	-
Culture & Multiculturalism	-	-	-	-	-	-	-	-	-
Economic Development & Trade	-	-	-	-	-	-	-	-	-
Education	-	-	-	-	-	-	-	-	-
Educational Communications Corporation ACCESS	-	-	-	-	-	-	-	-	-
Energy	-	136	10,086	-	-	-	-	-	-
Environment	90	-	-	-	5	475	589	1,372	-
Environmental Centre	-	137	-	-	-	991	207	1,706	-
Environment Council	-	-	-	-	-	-	-	-	864
Family & Social Services	-	-	-	-	-	-	-	-	-
Forestry, Lands & Wildlife	2	-	-	44	-	-	94	-	-
Health	-	-	-	-	-	107	7	-	7
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	-
Labour	-	-	-	-	-	-	-	-	-
Municipal Affairs	-	-	-	-	1,552	-	-	-	-
AOSTRA	-	-	37,952	-	-	-	-	-	-
Occupational Health & Safety	-	-	-	-	-	-	-	-	-
Recreation & Parks	-	-	-	-	-	-	-	-	64
Solicitor General	-	-	-	-	-	-	-	-	-
Technology, Research & Telecommunications	-	-	-	-	-	-	-	-	-
Tourism	-	-	-	-	-	-	-	-	-
Transportation & Utilities	-	-	-	-	-	-	-	-	-
Treasury	-	-	-	-	-	-	-	-	-
TOTAL	**192**	**273**	**48,038**	**44**	**1,557**	**1,573**	**897**	**3,078**	**935**

TABLE 21. Objectives of Expenditures by Department or Agency, 1989-90e - Continued

Department or agency	Health	Industrial and economic development					
		Agriculture	Fisheries	Forestry	Manufacturing	Minerals	Other
	($'000)						
Advanced Education	-	-	-	-	-	-	-
Agriculture	-	21,077	-	-	-	-	-
Alcoholism & Drug Abuse Commission	790	-	-	-	-	-	-
Attorney General	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	-	-	-
Consumer & Corporate Affairs	-	-	-	-	-	-	-
Culture & Multiculturalism	-	-	-	-	-	-	-
Economic Development & Trade	-	-	-	-	380	528	1,831
Education	-	-	-	-	-	-	-
Educational Communications Corporation ACCESS	-	-	-	-	-	-	-
Energy	-	-	-	-	-	-	-
Environment	-	6	-	-	-	-	2,204
Environmental Centre	3,795	2,617	137	137	-	-	-
Environment Council	-	-	-	-	-	-	-
Family & Social Services	-	-	-	-	-	-	-
Forestry, Lands & Wildlife	-	-	268	3,268	-	-	-
Health	6,182	-	-	-	-	-	-
Alberta Heritage Foundation for Medical Research	34,792	-	-	-	-	-	-
Labour	-	-	-	-	-	-	439
Municipal Affairs	-	-	-	-	-	-	-
AOSTRA	-	-	-	-	-	-	-
Occupational Health & Safety	1,197	-	-	-	-	-	-
Recreation & Parks	12	-	-	-	-	-	-
Solicitor General	-	-	-	-	-	-	-
Technology, Research & Telecommunications	-	-	-	-	45,058	-	-
Tourism	-	-	-	-	-	-	-
Transportation & Utilities	-	-	-	-	-	-	-
Treasury	-	-	-	-	-	-	-
TOTAL	**46,768**	**23,700**	**405**	**3,405**	**45,438**	**528**	**4,474**

TABLE 21. Objectives of Expenditures by Department or Agency, 1989-90e - Concluded

Department or agency	Social development					Transportation	Wildlife	Other	Total
	Culture, sport and recreation	Education	Human resources	Urban and regional studies	Other				
	($'000)								
Advanced Education	800	1,639	-	-	72	-	-	-	2,611
Agriculture	-	-	-	-	-	-	-	-	21,077
Alcoholism & Drug Abuse Commission	-	-	-	-	-	-	-	-	790
Attorney General	-	-	-	-	300	-	-	-	300
Career Development & Employment	-	-	1,557	-	-	-	-	-	1,557
Consumer & Corporate Affairs	-	-	-	-	115	-	-	-	115
Culture & Multiculturalism	3,055	-	-	-	-	-	-	-	3,055
Economic Development & Trade	-	-	-	-	-	1,319	-	-	4,058
Education	-	2,250	-	-	-	-	-	-	2,250
Educational Communications Corporation ACCESS	-	112	-	-	-	-	-	-	112
Energy	-	-	-	-	-	-	-	-	10,222
Environment	-	-	-	-	-	-	1	555	5,297
Environmental Centre	768	-	-	-	-	-	776	-	11,271
Environment Council	-	-	-	-	-	-	-	-	864
Family & Social Services	-	110	250	-	247	-	-	-	607
Forestry, Lands & Wildlife	-	-	-	-	15,800	-	1,975	-	21,451
Health	-	44	-	-	-	-	-	-	6,347
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	34,792
Labour	-	-	640	-	200	-	-	-	1,279
Municipal Affairs	-	-	-	2,431	-	-	-	-	3,983
AOSTRA	-	-	-	-	-	-	-	-	37,952
Occupational Health & Safety	-	-	-	-	-	-	-	-	1,197
Recreation & Parks	375	-	-	-	-	-	50	-	501
Solicitor General	-	-	-	-	2,289	-	-	-	2,289
Technology, Research & Telecommunications	-	-	-	-	-	-	-	-	45,058
Tourism	-	-	-	-	1,869	-	-	-	1,869
Transportation & Utilities	-	-	-	-	-	9,952	-	-	9,952
Treasury	-	-	1,420	-	-	-	-	768	2,188
TOTAL	**4,998**	**4,155**	**3,867**	**2,431**	**20,892**	**11,271**	**2,802**	**1,323**	**233,044**

TABLE 22. Objectives of Expenditures by Activity, 1989-90a

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	($'000)				
Advancement of science	-	-	192	-	192
Energy and fuels:					
Conservation	224	-	49	-	273
Fossil fuels	4,466	-	43,178	394	48,038
Renewable resources	-	44	-	-	44
Other	675	325	348	209	1,557
Environmental issues:					
Air	365	840	319	49	1,573
Land	174	123	520	80	897
Water	279	2,323	398	78	3,078
Other	-	885	-	50	935
Health	2,996	5,665	37,372	735	46,768
Industrial and economic development:					
Agriculture	9,849	7,973	4,610	1,268	23,700
Fisheries	258	115	-	32	405
Forestry	883	514	1,558	450	3,405
Manufacturing	139	441	43,205	1,653	45,438
Minerals	-	228	-	300	528
Other	-	3,181	-	1,293	4,474
Social development:					
Culture, sport and recreation	2,752	1,113	113	1,020	4,998
Education	203	1,845	117	1,990	4,155
Human resources	80	'3,280	80	427	3,867
Urban and regional studies ..	-	2,206	-	225	2,431
Other	1,257	13,801	1,331	4,503	20,892
Transportation	740	8,945	1,070	516	11,271
Wildlife	1,061	1,050	90	601	2,802
Other	-	942	-	381	1,323
**TOTAL	**26,401**	**55,839**	**134,550**	**16,254**	**233,044**

Natural Sciences

TABLE 23. Total Expenditures in the Natural Sciences by Activity, 1982-83 to 1989-90

Activity	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Research and development								
Current expenditures:								
In-house	14,514	15,128	14,251	15,312	17,105	13,491	17,719	17,185
Contracts	51,563	46,107	84,544	55,733	86,724	41,096	27,483	41,943
Grants	61,661	79,695	82,533	103,084	140,493	107,096	93,204	87,530
Research fellowships	283	473	528	433	412	847	150	3,566
Administration of extramural R&D programs	...	...	...	...	...	7,102	8,440	5,419
Sub-total	128,021	141,403	181,856	174,562	244,734	169,632	146,996	155,643
Capital expenditures	8,020	11,409	2,396	1,171	653	491	610	743
Related scientific activities								
Current expenditures:								
Education support	...	...	112	84	66	55	6,001	116
Technical surveys	...	...	26,713	26,550	26,739	22,921	24,400	30,084
Information services	...	...	5,526	6,042	8,028	7,282	13,517	9,326
Special services & studies	...	...	5,319	6,347	5,283	7,491	10,098	5,456
Museum services	...	...	892	953	1,911	1,833	307	304
Administration of extramural RSA programs	...	...	...	...	...	265	560	585
Sub-total	30,592	34,807	38,562	39,976	42,027	39,847	54,883	45,871
Capital expenditures	2,357	2,408	1,839	1,844	1,578	1,594	2,509	2,207
TOTAL	**168,990**	**190,027**	**224,653**	**217,553**	**288,992**	**211,564**	**204,998**	**204,464**

TABLE 24. Total Expenditures in the Natural Sciences by Department or Agency, 1982-83 to 1989-90

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Agricultural Research Trust ..	373	369	414	391	410	467	...	...
Agriculture	16,391	19,532	19,272	19,787	17,153	17,626	20,776	21,077
Community & Occupational Health	...	...	...	...	120	562	...	...
Culture & Multiculturalism ...	578	798	892	953	2,625	1,833	1,864	1,417
Energy	...	...	...	...	7,917	6,248	4,527	10,222
Energy & Natural Resources ...	25,210	28,509	19,622	15,197	...	...	...	...
Environment	9,179	12,877	15,221	16,233	15,935	14,498	6,549	5,290
Environmental Centre	10,528	11,605	11,330	12,286	11,712	11,076	11,126	11,271
Executive Council	19,148	19,950	21,463	26,209	...	...	...	...
Forestry, Lands & Wildlife ...	...	...	...	...	8,760	6,715	22,092	21,451
Health	...	...	...	...	...	...	3,165	3,610
Alberta Heritage Foundation for Medical Research	21,588	27,562	32,748	43,878	56,930	51,167	37,623	34,792
Hospitals & Medical Care	16,865	19,793	17,725	21,121	22,080	2,071	...	...
Housing	...	467	885	1,085	...	...	...	...
Labour	548	483	476	510	558	518	719	654
Mental Health Research Fund[1] .	193	409	418	522	407	320	...	...
Municipal Affairs	...	...	...	...	1,233	1,172	1,057	1,552
AOSTRA	41,105	40,639	77,132	52,808	78,917	36,299	32,957	37,952
Occupational Health & Safety .	...	...	...	...	...	...	175	550
Recreation & Parks	429	328	388	265	89	96	219	126
Technology, Research & Telecommunications	...	...	...	...	55,092	51,297	53,000	45,058
Transportation & Utilities ...	6,816	6,515	6,227	5,908	9,054	9,599	9,149	9,442
Workers' Health, Safety & Compensation	39	191	440	400	...	...	...	...
TOTAL	**168,990**	**190,027**	**224,653**	**217,553**	**288,992**	**211,564**	**204,998**	**204,464**

1 Included with Department of Health as of 1988-89

TABLE 25. Total Expenditures in the Natural Sciences by Performer, 1982-83 to 1989-90

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Intramural	48,603	57,200	49,564	52,213	54,391	55,111	66,220	62,577
Industry	35,452	33,914	72,620	47,103	84,983	47,528	43,939	52,480
Universities	37,383	40,169	43,682	55,291	89,411	67,596	52,702	47,687
Hospitals and health organizations	11,080	16,498	15,206	18,454	18,479	607	1,423	1,690
Alberta Research Council[1]	32,349	35,038	38,597	39,143	33,748	33,032	31,411	32,557
Other	4,123	7,208	4,984	5,349	7,980	7,690	9,303	7,473
TOTAL	**168,990**	**190,027**	**224,653**	**217,553**	**288,992**	**211,564**	**204,998**	**204,464**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 26. Total Expenditures on R&D in the Natural Sciences by Performer, 1982-83 to 1989-90

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Intramural	22,534	26,728	17,012	16,888	18,541	21,144	26,910	23,847
Industry	32,058	31,784	68,366	44,031	82,261	44,012	33,303	46,913
Universities	36,199	38,952	42,694	54,151	88,421	66,953	47,837	45,970
Hospitals and health organizations	11,080	16,433	15,130	18,444	18,479	607	1,383	1,690
Alberta Research Council[1]	31,179	33,365	37,292	38,107	31,021	31,893	29,938	31,504
Other	2,991	5,550	3,758	4,112	6,664	5,514	8,235	6,462
TOTAL	**136,041**	**152,812**	**184,252**	**175,733**	**245,387**	**170,123**	**147,606**	**156,386**

1 Includes only annual funding by the Government of Alberta - other funds are not included

TABLE 27. Total Expenditures on R&D in the Natural Sciences by Department or Agency, 1982-83 to 1989-90

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Agricultural Research Trust ..	373	369	414	391	410	467	...	...
Agriculture	13,699	15,782	11,937	12,471	10,153	9,820	13,315	13,410
Community & Occupational Health	...	...	...	...	75	552	...	...
Culture & Multiculturalism ...	-	-	-	-	491	-	1,147	979
Energy	...	...	...	...	7,235	5,461	4,409	9,828
Energy & Natural Resources ...	16,412	20,318	12,776	7,618	...	...	...	...
Environment	3,558	3,949	4,467	4,949	5,159	4,033	821	655
Environmental Centre	4,007	4,399	4,369	4,947	5,373	5,103	5,670	5,516
Executive Council	19,148	19,950	21,463	26,209	...	...	...	...
Forestry, Lands & Wildlife ...	...	...	...	...	3,244	3,079	3,972	3,606
Health	...	...	...	...	...	...	2,576	3,171
Alberta Heritage Foundation for Medical Research	20,659	26,656	31,901	43,007	56,475	50,919	37,365	34,492
Hospitals & Medical Care	16,865	19,769	17,725	21,121	22,080	2,071	...	...
Housing .....[1]	-	370	775	958	...	...	...	...
Mental Health Research Fund .	193	409	418	522	407	320	...	...
Municipal Affairs	-	-	-	-	1,088	1,025	641	1,023
AOSTRA	41,105	40,639	77,132	52,808	78,917	36,299	30,235	37,952
Occupational Health & Safety .	...	...	...	...	...	...	175	550
Recreation & Parks	-	27	-	-	-	-	25	50
Technology, Research & Telecommunications	...	...	...	...	52,854	49,329	45,509	43,344
Transportation & Utilities ...	13	66	762	642	1,426	1,645	1,746	1,810
Workers' Health, Safety & Compensation	9	109	113	90	...	...	...	...
**TOTAL	**136,041**	**152,812**	**184,252**	**175,733**	**245,387**	**170,123**	**147,606**	**156,386**

1 Included with Department of Health as of 1988-89

TABLE 28 . Departmental Personnel Engaged in Scientific Activities in the Natural Sciences, by Activity and Category, 1982-83 to 1989-90

Activity and category	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	(person-years)							
Research & development:								
Scientific & professional	150	159	154	171	180	132	137	161
Technical	130	137	147	144	154	162	158	152
Other	50	52	66	64	66	45	44	48
Sub-total	330	348	367	379	400	339	339	361
Related scientific activities:								
Scientific & professional	190	297	323	337	324	282	256	255
Technical	220	376	426	414	434	410	533	530
Other	84	75	76	81	125	109	107	108
Sub-total	494	748	825	832	883	801	896	893
Administration of extramural programs:								
Scientific & professional	...	...	...	...	...	59	46	34
Technical	...	...	...	...	...	6	16	16
Other	...	...	...	...	...	48	56	48
Sub-total	...	...	...	...	...	113	118	98
Total scientific activities:								
Scientific & professional	340	456	477	508	504	473	439	450
Technical	350	513	573	558	588	578	707	698
Other	134	127	142	145	191	202	207	204
TOTAL	**824**	**1,096**	**1,192**	**1,211**	**1,283**	**1,253**	**1,353**	**1,352**

TABLE 29. Total Expenditures in the Natural Sciences by Sources of Funds, 1988-89

Department or agency	Departmental budget	Other departments	Federal government	Trust funds	Other sources	Total
	($'000)					
Agriculture	15,776	-	-	5,000	-	20,776
Culture & Multiculturalism	1,314	-	550	-	-	1,864
Energy	4,527	-	-	-	-	4,527
Environment	6,265	-	-	284	-	6,549
Environmental Centre	10,706	-	45	-	375	11,126
Forestry, Lands & Wildlife	21,051	-	864	177	-	22,092
Health	768	-	-	2,397	-	3,165
Alberta Heritage Foundation for Medical Research	-	-	-	-	37,623	37,623
Labour	719	-	-	-	-	719
Municipal Affairs	1,057	-	-	-	-	1,057
AOSTRA	3,400	-	-	29,557	-	32,957
Occupational Health & Safety	-	-	-	175	-	175
Recreation & Parks	154	-	-	-	65	219
Technology, Research & Telecommunications	53,000	-	-	-	-	53,000
Transportation & Utilities	9,149	-	-	-	-	9,149
TOTAL	**127,886**	**-**	**1,459**	**37,590**	**38,063**	**204,998**

TABLE 30. Total Expenditures in the Natural Sciences by Activity and Performer, 1988-89

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Research and development							
Current expenditures:							
In-house	17,719	...	...	...	...	...	17,719
Contracts	141	17,329	2,748	-	5,380	1,885	27,483
Grants	...	15,974	45,089	1,383	24,408	6,350	93,204
Research fellowships	-	-	-	-	150	-	150
Administration of extramural R&D programs	8,440	...	...	...	...	...	8,440
Sub-total	26,300	33,303	47,837	1,383	29,938	8,235	146,996
Capital expenditures	610	...	...	...	...	...	610
Related scientific activities							
Current expenditures:							
Education support	5,706	-	295	-	-	-	6,001
Technical surveys	19,144	4,337	50	-	-	869	24,400
Information services	7,039	1,191	4,507	40	720	20	13,517
Special services and studies	4,064	5,098	13	-	744	179	10,098
Museum services	288	10	-	-	9	-	307
Administration of extramural RSA programs	560	...	...	...	...	...	560
Sub-total	36,801	10,636	4,865	40	1,473	1,068	54,883
Capital expenditures	2,509	...	...	...	...	...	2,509
TOTAL	**66,220**	**43,939**	**52,702**	**1,423**	**31,411**	**9,303**	**204,998**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 31. Total Expenditures in the Natural Sciences by Department or Agency and Performer, 1988-89

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Agriculture	14,830	1,112	2,330	-	723	1,781	20,776
Culture & Multiculturalism	1,810	32	22	-	-	-	1,864
Energy	916	2,246	399	-	727	239	4,527
Environment	3,748	1,590	30	-	174	1,007	6,549
Environmental Centre	10,143	800	103	-	75	5	11,126
Forestry, Lands & Wildlife	15,407	5,421	314	-	822	128	22,092
Health	589	-	1,014	1,383	179	-	3,165
Alberta Heritage Foundation for Medical Research	1,376	-	33,313	-	-	2,934	37,623
Labour	298	421	-	-	-	-	719
Municipal Affairs	543	514	-	-	-	-	1,057
AOSTRA	8,009	15,964	3,535	-	4,714	735	32,957
Occupational Health & Safety	22	-	153	-	-	-	175
Recreation & Parks	77	102	40	-	-	-	219
Technology, Research & Telecommunications	482	15,504	11,301	40	23,650	2,023	53,000
Transportation & Utilities	7,970	233	148	-	347	451	9,149
TOTAL	**66,220**	**43,939**	**52,702**	**1,423**	**31,411**	**9,303**	**204,998**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 32. Total Expenditures on R&D in the Natural Sciences by Department or Agency and Performer, 1988-89

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Agriculture	8,608	507	2,327	-	101	1,772	13,315
Culture & Multiculturalism	1,140	7	-	-	-	-	1,147
Energy	870	2,211	399	-	727	202	4,409
Environment	185	446	20	-	165	5	821
Environmental Centre	4,687	800	103	-	75	5	5,670
Forestry, Lands & Wildlife	1,712	1,118	314	-	700	128	3,972
Health	48	-	966	1,383	179	-	2,576
Alberta Heritage Foundation for Medical Research	1,376	-	33,069	-	-	2,920	37,365
Municipal Affairs	359	282	-	-	-	-	641
AOSTRA	7,088	15,108	3,310	-	3,994	735	30,235
Occupational Health & Safety	22	-	153	-	-	-	175
Recreation & Parks	25	-	-	-	-	-	25
Technology, Research & Telecommunications	145	12,669	7,028	-	23,650	2,017	45,509
Transportation & Utilities	645	155	148	-	347	451	1,746
TOTAL	**26,910**	**33,303**	**47,837**	**1,383**	**29,938**	**8,235**	**147,606**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 33. Total Expenditures in the Natural Sciences by Department or Agency and Activity, 1988-89

Department or agency	Research and development			Related scientific activities							Total
	Current	AEP[1]	Capital	Education support	Technical surveys	Information services	Special services and studies	Museum	AEP[1]	Capital	
	($'000)										
Agriculture	11,725	1,590	-	-	863	4,824	1,774	-	-	-	20,776
Culture & Multiculturalism .	960	-	187	22	110	-	-	298	-	287	1,864
Energy	3,539	855	15	-	-	-	118	-	-	-	4,527
Environment	773	48	-	-	2,867	72	2,581	9	138	61	6,549
Environmental Centre	5,358	94	218	5,271	-	-	-	-	-	185	11,126
Forestry, Lands & Wildlife	3,733	164	75	55	15,054	1,270	781	-	255	705	22,092
Health	2,567	9	-	48	-	503	15	-	5	18	3,165
Alberta Heritage Foundation for Medical Research .	35,989	1,376	-	-	-	258	-	-	-	-	37,623
Labour	-	-	-	-	-	421	298	-	-	-	719
Municipal Affairs ..	282	359	-	-	-	162	133	-	121	-	1,057
AOSTRA	26,530	3,688	17	605	-	917	1,200	-	-	-	32,957
Occupational Health & Safety	153	22	-	-	-	-	-	-	-	-	175
Recreation & Parks .	25	-	-	-	52	-	136	-	6	-	219
Technology, Research & Telecommunication	45,364	145	-	-	-	4,466	3,025	-	-	-	53,000
Transportation & Utilities	1,558	90	98	-	5,434	624	37	-	35	1,253	9,149
TOTAL	**138,556**	**8,440**	**610**	**6,001**	**24,400**	**13,517**	**10,098**	**307**	**560**	**2,509**	**204,998**

1 Administration of extramural programs.

TABLE 34. Intramural Expenditures in the Natural Sciences by Department or Agency and Type of Expenditure, 1988-89

Department or agency	Current expenditures		Capital expenditures	Total
	Personnel costs	Other costs		
	($'000)			
Agriculture	9,834	4,996	-	14,830
Culture & Multiculturalism	1,121	215	474	1,810
Energy	861	40	15	916
Environment	2,967	720	61	3,748
Environmental Centre	7,672	2,068	403	10,143
Forestry, Lands & Wildlife	10,867	3,760	780	15,407
Health	352	219	18	589
Alberta Heritage Foundation for Medical Research	546	830	-	1,376
Labour	298	-	-	298
Municipal Affairs	411	132	-	543
AOSTRA	6,054	1,938	17	8,009
Occupational Health & Safety	17	5	-	22
Recreation & Parks	52	25	-	77
Technology, Research & Telecommunications	333	149	-	482
Transportation & Utilities	5,311	1,308	1,351	7,970
TOTAL	**46,696**	**16,405**	**3,119**	**66,220**

TABLE 35. Departmental Personnel Engaged in Scientific Activities in the Natural Sciences by Department or Agency, 1988-89

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Agriculture	59	83	-	142	115	156	-	271
Culture & Multiculturalism	6	9	1	16	6	9	2	17
Energy	-	-	-	-	1	-	1	2
Environment	1	1	-	2	17	38	2	57
Environmental Centre	26	51	21	98	37	63	30	130
Forestry, Lands & Wildlife	25	10	10	45	30	183	23	236
Health	-	1	-	1	2	4	3	9
Alberta Heritage Foundation of Medical Research	-	-	-	-	-	-	-	-
Labour	-	-	-	-	6	-	-	6
Municipal Affairs	4	-	-	4	-	-	-	-
AOSTRA	11	-	9	20	3	-	3	6
Occupational Health & Safety	-	-	-	-	-	-	-	-
Recreation & Parks	-	-	-	-	1	1	-	2
Technology, Research & Telecommunications	-	-	-	-	6	-	-	6
Transportation & Utilities	5	3	3	11	32	79	43	154
TOTAL	**137**	**158**	**44**	**339**	**256**	**533**	**107**	**896**

TABLE 35. Departmental Personnel Engaged in Scientific Activities in the Natural Sciences by Department or Agency, 1988-89 - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Agriculture	2	2	8	12	176	241	8	425
Culture & Multiculturalism	-	-	-	-	12	18	3	33
Energy	6	-	5	11	7	-	6	13
Environment	3	-	1	4	21	39	3	63
Environmental Centre	2	-	1	3	65	114	52	231
Forestry, Lands & Wildlife	10	13	16	39	65	206	49	320
Health	-	-	-	-	2	5	3	10
Alberta Heritage Foundation for Medical Research	4	-	11	15	4	-	11	15
Labour	-	-	-	-	6	-	-	6
Municipal Affairs	1	-	4	5	5	-	4	9
AOSTRA	12	-	10	22	26	-	22	48
Occupational Health & Safety	1	-	-	1	1	-	-	1
Recreation & Parks	-	-	-	-	1	1	-	2
Technology, Research & Telecommunications	3	-	-	3	9	-	-	9
Transportation & Utilities	2	1	-	3	39	83	46	168
TOTAL	**46**	**16**	**56**	**118**	**439**	**707**	**207**	**1,353**

TABLE 36. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1988-89

Department or agency	Advancement of science	Energy and fuels				Environmental issues			
		Conservation	Fossil fuels	Renewable resources	Other	Air	Land	Water	Other
	($'000)								
Agriculture	-	-	-	-	-	-	-	-	-
Culture & Multiculturalism	-	-	-	-	-	-	-	-	-
Energy	-	148	4,307	72	-	-	-	-	-
Environment	75	5	-	-	-	521	342	1,748	678[1]
Environmental Centre	-	-	140	-	-	908	222	1,595	-
Forestry, Lands & Wildlife	2	-	-	44	-	-	84	-	-
Health	-	-	-	-	-	13	-	-	-
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	-
Labour	-	-	-	-	-	-	-	-	-
Municipal Affairs	-	-	-	-	1,057[2]	-	-	-	-
AOSTRA	-	-	32,957	-	-	-	-	-	-
Occupational Health & Safety	-	-	-	-	-	-	-	-	-
Recreation & Parks	-	-	-	-	-	-	-	40	142[3]
Technology, Research & Telecommunications	-	-	-	-	-	-	-	-	-
Transportation & Utilities	-	-	-	-	-	-	-	-	-
TOTAL	**77**	**153**	**37,404**	**116**	**1,057**	**1,442**	**648**	**3,383**	**820**

1 Water Management

2 Housing - Built Form

3 Conservation

TABLE 36. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1988-89 - Continued

Department or agency	Health	Industrial and economic development				
		Agriculture	Fisheries	Forestry	Manufacturing	Other
	($'000)					
Agriculture	-	20,776	-	-	-	-
Culture & Multiculturalism	-	-	-	-	-	-
Energy	-	-	-	-	-	-
Environment	-	491	5	-	-	2,078[1]
Environmental Centre	3,394	2,679	140	140	-	328[2]
Forestry, Lands & Wildlife	-	-	270	3,926	-	-
Health	3,104	-	-	-	-	-
Alberta Heritage Foundation for Medical Research	37,623	-	-	-	-	-
Labour	-	-	-	-	-	298[3]
Municipal Affairs	-	-	-	-	-	-
AOSTRA	-	-	-	-	-	-
Occupational Health & Safety	175	-	-	-	-	-
Recreation & Parks	12	-	-	-	-	-
Technology, Research & Telecommunications	-	-	-	-	53,000	-
Transportation & Utilities	-	-	-	-	-	-
TOTAL	**44,308**	**23,946**	**415**	**4,066**	**53,000**	**2,704**

1 Water resources management

2 Trapping Safety

3 Safety Standards development

TABLE 36. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1988-89 - Concluded

Department or agency	Social Development					Transportation	Wildlife	Other	Total
	Culture, sport and recreation	Education	Human ressources	Urban & regional studies	Other				
	($'000)								
Agriculture	-	-	-	-	-	-	-	-	20,776
Culture & Multiculturalism	1,864	-	-	-	-	-	-	-	1,864
Energy	-	-	-	-	-	-	-	-	4,527
Environment	6	2	-	7	-	-	11	580[1]	6,549
Environmental Centre	786	-	-	-	-	-	794	-	11,126
Forestry, Lands & Wildlife	-	-	-	-	15,800[2]	-	1,966	-	22,092
Health	-	48	-	-	-	-	-	-	3,165
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	37,623
Labour	-	-	307	-	114[3]	-	-	-	719
Municipal Affairs	-	-	-	-	-	-	-	-	1,057
AOSTRA	-	-	-	-	-	-	-	-	32,957
Occupational Health & Safety	-	-	-	-	-	-	-	-	175
Recreation & Parks	-	-	-	-	-	-	25	-	219
Technology, Research & Telecommunications	-	-	-	-	-	-	-	-	53,000
Transportation & Utilities	-	-	-	-	-	9,149	-	-	9,149
TOTAL	**2,656**	**50**	**307**	**7**	**15,914**	**9,149**	**2,796**	**580**	**204,998**

1 Water resources development
2 Digital Mapping - Surveys
3 Public Safety

TABLE 37. Objectives of Expenditures in the Natural Sciences by Activity, 1988-89

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	($'000)				
Advancement of science	-	-	77	-	77
Communications	-	5	-	-	5
Energy and fuels:					
Conservation	85	5	63	-	153
Fossil fuels	8,013	967	26,623	1,801	37,404
Renewable resources	-	44	-	72	116
Other	359	184	282	232	1,057
Environmental issues:					
Air	321	801	232	88	1,442
Land	145	119	323	61	648
Water	258	2,235	540	350	3,383
Other	50	115	173	482	820
Health	2,284	2,815	38,951	258	44,308
Industrial and economic development:					
Agriculture	9,682	7,892	4,712	1,660	23,946
Fisheries	259	109	-	47	415
Forestry	949	502	1,867	748	4,066
Manufacturing	145	337	45,364	7,154	53,000
Other	328	1,507	-	869	2,704
Social development:					
Culture, sport and recreation	1,748	849	7	52	2,656
Education	-	2	-	48	50
Human resources	-	-	-	307	307
Urban & regional studies	-	1	-	6	7
Other	500	12,000	300	3,114	15,914
Transportation	645	7,325	1,101	78	9,149
Wildlife	1,104	1,041	41	610	2,796
Other	35	455	40	45	575
TOTAL	**26,910**	**39,310**	**120,696**	**18,082**	**204,998**

TABLE 38. Total Expenditures in the Natural Sciences by Activity and Performer, 1989-90a

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Research and development							
Current expenditures:							
In-house	17,185	...	...	...	...	...	17,185
Contracts	500	27,501	5,235	-	5,500	3,207	41,943
Grants	...	19,412	39,161	...	25,702	3,255	87,530
Research fellowships	-	-	1,574	1,690	302	...	3,566
Administration of extramural R&D programs	5,419	...	...	...	...	...	5,419
Sub-total	23,104	46,913	45,970	1,690	31,504	6,462	155,643
Capital expenditures	743	...	...	...	...	...	743
Related scientific activities							
Current expenditures:							
Education support	50	-	66	-	-	-	116
Technical surveys	25,086	3,705	10	-	349	934	30,084
Information services	6,680	995	1,638	-	-	13	9,326
Special services and studies	3,828	857	3	-	704	64	5,456
Museum services	294	10	-	-	-	-	304
Administrataion of extramural RSA programs	585	...	...	...	...	...	585
Sub-total	36,523	5,567	1,717	-	1,053	1,011	45,871
Capital expenditures	2,207	...	...	...	...	...	2,207
TOTAL	**62,577**	**52,480**	**47,687**	**1,690**	**32,557**	**7,473**	**204,464**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 39. Total Expenditures in the Natural Sciences by Department or Agency and Performer, 1989-90e

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Agriculture	15,200	1,105	2,403	-	660	1,709	21,077
Culture & Multiculturalism	1,363	32	22	-	-	-	1,417
Energy	1,101	7,291	79	-	1,621	130	10,222
Environment	3,568	463	20	-	249	990	5,290
Environmental Centre	10,371	800	10	-	90	-	11,271
Forestry, Lands & Wildlife	15,379	5,141	261	-	550	120	21,451
Health	444	-	1,268	1,690	182	26	3,610
Alberta Heritage Foundation for Medical Research	1,513	-	30,666	-	-	2,613	34,792
Labour	439	215	-	-	-	-	654
Municipal Affairs	999	478	75	-	-	-	1,552
AOSTRA	3,452	25,590	3,250	-	4,260	1,400	37,952
Occupational Health & Safety	50	-	500	-	-	-	550
Recreation & Parks	26	50	25	-	-	25	126
Technology, Research & Telecommunications	380	11,165	8,943	-	24,570	-	45,058
Transportation & Utilities	8,292	150	165	-	375	460	9,442
TOTAL	**62,577**	**52,480**	**47,687**	**1,690**	**32,557**	**7,473**	**204,464**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 40. Total Expenditures in the Natural Sciences by Department or Agency and Activity, 1989-90e

	Research and development			Related scientific activities							Total
	Current	AEP[1]	Capital	Education support	Technical surveys	Information services	Special services and studies	Museum	AEP[1]	Capital	
	($'000)										
Agriculture	11,610	1,800	-	-	900	4,900	1,867	-	-	-	21,077
Culture & Multiculturalism	979	-	-	22	112	-	-	304	-	-	1,417
Energy	8,727	1,079	22	-	349	-	45	-	-	-	10,222
Environment	576	79	-	-	2,209	70	2,210	-	96	50	5,290
Environmental Centre	5,155	60	301	-	5,415	-	-	-	-	340	11,271
Forestry, Lands & Wildlife	3,392	164	50	50	15,108	1,250	482	-	255	700	21,451
Health	3,161	10	-	44	15	346	25	-	9	-	3,610
Alberta Heritage Foundation for Medical Research	32,979	1,513	-	-	-	300	-	-	-	-	34,792
Labour	-	-	-	-	-	215	439	-	-	-	654
Municipal Affairs	348	435	240	-	-	219	115	-	195	-	1,552
AOSTRA	37,947	-	5	-	-	-	-	-	-	-	37,952
Occupational Health & Safety	500	50	-	-	-	-	-	-	-	-	550
Recreation & Parks	50	-	-	-	76	-	-	-	-	-	126
Technology, Research & Telecommunications	43,205	139	-	-	-	1,481	233	-	-	-	45,058
Transportation & Utilities	1,595	90	125	-	5,900	545	40	-	30	1,117	9,442
TOTAL	**150,224**	**5,419**	**743**	**116**	**30,084**	**9,326**	**5,456**	**304**	**585**	**2,207**	**204,464**

1 Administration of extramural programs.

TABLE 41. Total Expenditures on R&D in the Natural Sciences by Department or Agency and Performer, 1989-90e

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Agriculture	8,800	500	2,400	-	10	1,700	13,410
Culture & Multiculturalism	972	7	-	-	-	-	979
Energy	1,101	7,291	79	-	1,227	130	9,828
Environment	84	320	10	-	240	1	655
Environmental Centre	4,616	800	10	-	90	-	5,516
Forestry, Lands & Wildlife	1,656	1,019	261	-	550	120	3,606
Health	49	-	1,224	1,690	182	26	3,171
Alberta Heritage Foundation for Medical Research	1,513	-	30,379	-	-	2,600	34,492
Municipal Affairs	675	273	75	-	-	-	1,023
AOSTRA	3,452	25,590	3,250	-	4,260	1,400	37,952
Occupational Health & Safety	50	-	500	-	-	-	550
Recreations & Parks	-	-	25	-	-	25	50
Technology, Research & Telecommunications	139	11,043	7,592	-	24,570	-	43,344
Transportation & Utilities	740	70	165	-	375	460	1,810
TOTAL	**23,847**	**46,913**	**45,970**	**1,690**	**31,504**	**6,462**	**156,386**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 42. Departmental Personnel Engaged in Scientific Activities in the Natural Sciences by Department or Agency, 1989-90e

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Agriculture	59	83	-	142	115	156	-	271
Culture & Multiculturalism	6	9	1	16	6	9	2	17
Energy	-	-	-	-	-	-	-	-
Environment	-	1	-	1	19	38	3	60
Environmental Centre	26	45	22	93	37	61	32	130
Forestry, Lands & Wildlife	28	10	3	41	33	182	23	238
Health	-	1	-	1	2	3	3	8
Alberta Heritage Foundation Medical Research	-	-	-	-	-	-	-	-
Labour	-	-	-	-	8	-	-	8
Municipal Affairs	5	-	-	5	-	-	-	-
AOSTRA	31	-	19	50	-	-	-	-
Occupational Health & Safety	-	-	-	-	-	-	-	-
Recreation & Parks	-	-	-	-	-	1	-	1
Technology, Research & Telecommunications	-	-	-	-	2	-	-	2
Transportation & Utilities	6	3	3	12	33	80	45	158
TOTAL	**161**	**152**	**48**	**361**	**255**	**530**	**108**	**893**

TABLE 42. **Departmental Personnel Engaged in Scientific Activities in the Natural Sciences by Department or Agency, 1989-90e** - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Agriculture	2	2	8	12	176	241	8	425
Culture & Multiculturalism	-	-	-	-	12	18	3	33
Energy	7	-	6	13	7	-	6	13
Environment	2	-	2	4	21	39	5	65
Environmental Centre	1	-	1	2	64	106	55	225
Forestry, Lands & Wildlife	10	13	16	39	71	205	42	318
Health	1	-	-	1	3	4	3	10
Alberta Heritage Foundation Medical Research	4	-	11	15	4	-	11	15
Labour	-	-	-	-	8	-	-	8
Municipal Affairs	1	-	4	5	6	-	4	10
AOSTRA	-	-	-	-	31	-	19	50
Occupational Health & Safety	1	-	-	1	1	-	-	1
Recreation & Parks	-	-	-	-	-	1	-	1
Technology, Research & Telecommunications	3	-	-	3	5	-	-	5
Transportation & Utilities	2	1	-	3	41	84	48	173
TOTAL	**34**	**16**	**48**	**98**	**450**	**698**	**204**	**1,352**

TABLE 43. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1989-90e

Department or agency	Advancement of science	Communications	Energy and fuels				Environmental issues			
			Conservation	Fossil fuels	Renewable resources	Other	Air	Land	Water	Other
	($'000)									
Agriculture	-	-	-	-	-	-	-	-	-	-
Culture & Multiculturalism	-	-	-	-	-	-	-	-	-	
Energy	-	-	136	10,086	-	-	-	-	-	-
Environment	90	5	-	-	-	-	475	589	1,372	-
Environmental Centre	-	-	137	-	-	-	991	207	1,706	-
Forestry, Lands & Wildlife	2	-	-	-	44	-	-	94	-	-
Health	-	-	-	-	-	-	107	7	-	7
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	-	-
Labour	-	-	-	-	-	-	-	-	-	-
Municipal Affairs	-	-	-	-	-	1,552	-	-	-	-
AOSTRA	-	-	-	37,952	-	-	-	-	-	-
Occupational Health & Safety	-	-	-	-	-	-	-	-	-	-
Recreation & Parks	-	-	-	-	-	-	-	-	-	64
Technology, Research & Telecommunications	-	-	-	-	-	-	-	-	-	-
Transportation & Utilities	-	-	-	-	-	-	-	-	-	-
TOTAL	**92**	**5**	**273**	**48,038**	**44**	**1,552**	**1,573**	**897**	**3,078**	**71**

TABLE 43. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1989-90e - Continued

Department or agency	Health	Industrial and economic development				
		Agriculture	Fisheries	Forestry	Manufacturing	Other
	($'000)					
Agriculture	-	21,077	-	-	-	-
Culture & Multiculturalism	-	-	-	-	-	-
Energy	-	-	-	-	-	-
Environment	-	5	-	-	-	2,204[1]
Environmental Centre	3,795	2,617	137	137	-	-
Forestry, Lands & Wildlife	-	-	268	3,268	-	-
Health	3,445	-	-	-	-	-
Alberta Heritage Foundation for Medical Research	34,792	-	-	-	-	-
Labour	-	-	-	-	-	439
Municipal Affairs	-	-	-	-	-	-
AOSTRA	-	-	-	-	-	-
Occupational Health & Safety	550	-	-	-	-	-
Recreation & Parks	12	-	-	-	-	-
Technology, Research & Telecommunications	-	-	-	-	45,058	-
Transportation & Utilities	-	-	-	-	-	-
TOTAL	**42,594**	**23,699**	**405**	**3,405**	**45,058**	**2,643**

1 Water Resources Management

TABLE 43. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1989-90e - Concluded

Department or agency	Social Development				Transportation	Wildlife	Other	Total
	Culture, sport and recreation	Education	Human Resources	Other				
	($'000)							
Agriculture	-	-	-	-	-	-	-	21,077
Culture	1,417	-	-	-	-	-	-	1,417
Energy	-	-	-	-	-	-	-	10,222
Environment	-	-	-	-	-	-	550[1]	5,290
Environmental Centre	768	-	-	-	-	776	-	11,271
Forestry, Lands & Wildlife	-	-	-	15,800[2]	-	1,975	-	21,451
Health	-	44	-	-	-	-	-	3,610
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	34,792
Labour	-	-	15	200[3]	-	-	-	654
Municipal Affairs	-	-	-	-	-	-	-	1,552
AOSTRA	-	-	-	-	-	-	-	37,952
Occupational Health & Safety	-	-	-	-	-	-	-	550
Recreation & Parks	-	-	-	-	-	50	-	126
Technology, Research & Telecommunications	-	-	-	-	-	-	-	45,058
Transportation & Utilities	-	-	-	-	9,442	-	-	9,442
TOTAL	**2,185**	**44**	**15**	**16,000**	**9,442**	**2,801**	**550**	**204,464**

1 Water Resources Management
2 Digital Mapping Surveys
3 Public Safety

TABLE 44. Objectives of Expenditures in the Natural Sciences by Activity, 1989-90a

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	($'000)				
Advancement of science	-	-	92	-	92
Communications	-	5	-	-	5
Energy and fuels:					
Conservation	224	-	49	-	273
Fossil fuels	4,466	-	43,178	394	48,038
Renewable resources	-	44	-	-	44
Other	675	324	348	205	1,552
Environmental issues:					
Air	365	840	319	49	1,573
Land	174	123	520	80	897
Water	279	2,323	398	78	3,078
Other	-	21	-	50	71
Health	2,669	2,830	36,795	300	42,594
Industrial and economic development:					
Agriculture	9,849	7,973	4,610	1,267	23,699
Fisheries	258	115	-	32	405
Forestry	883	514	1,558	450	3,405
Manufacturing	139	241	43,205	1,473	45,058
Minerals	-	1,270	-	934	2,204
Other	-	439	-	-	439
Social development and related areas:					
Culture, sport and recreation	1,565	566	7	47	2,185
Education	-	-	-	44	44
Human resources	-	-	-	15	15
Other	500	12,000	300	3,200	16,000
Transportation	740	7,552	1,070	80	9,442
Wildlife	1,061	1,050	90	600	2,801
Other	-	500	-	50	550
TOTAL	**23,847**	**38,730**	**132,539**	**9,348**	**204,464**

Social Sciences and Humanities

TABLE 45. Total Expenditures in the Social Sciences and Humanities, by Activity 1982-83 to 1989-90

Activity	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Research and development								
Current expenditures:								
In-house	237	657	1,263	1,265	3,727	363	2,130	2,344
Contracts	406	551	436	619	1,375	502	1,903	1,279
Grants	1,038	1,228	1,042	1,727	1,367	1,217	808	811
Research fellowships	23	30	5	20	21	111	-	43
Administration of extramural R&D programs	...	...	...	...	...	349	81	86
Sub-total	1,704	2,466	2,746	3,631	6,490	2,542	4,922	4,563
Capital expenditures	10	2	2	3	45	31	95	2
Related scientific activities								
Current expenditures	38,546	40,732	39,579	46,460	35,960	27,311	22,699	23,422
Administration of extramural RSA programs	...	...	...	...	...	298	377	430
Sub-total	38,546	40,732	39,579	46,460	35,960	27,609	23,076	23,852
Capital expenditures	3,578	5,641	9,734	4,731	1,940	1,165	1,353	163
TOTAL	**43,838**	**48,841**	**52,061**	**54,825**	**44,435**	**31,347**	**29,446**	**28,580**

TABLE 46. Total Expenditures in the Social Sciences and Humanities by Department or Agency, 1982-83 to 1989-90

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Advanced Education	...	1,354	1,639	2,150	1,783	1,561	2,176	2,611
Advanced Education & Manpower	2,612	...	...	...	...	...	...	...
Alcoholism & Drug Abuse Commission	264	320	308	524	584	396	577	790
Attorney General	290	436	407	363	363	326	300	300
Career Development & Employment	...	...	...	...	1,863	1,716	1,588	1,557
Community & Occupational Health	...	...	...	...	866	948	...	...
Consumer & Corporate Affairs	143	172	157	154	174	191	98	115
Culture & Multiculturalism	16,480	21,515	25,736	20,736	16,973	5,600	2,935	1,638
Economic Development	4,093	3,374	3,180	4,418	...	...	...	...
Economic Development & Trade	...	...	...	...	5,740	5,391	3,478	4,058
Education	3,617e	2,724	3,019	3,068	2,507	1,728	2,139	2,250
Educational Communications Corporation ACCESS	200e	398	350	350	350	385	367	112
Environment	508	232	123	515	549	92	7	7
Environment Council	1,243	1,525	1,176	1,060	1,245	1,016	939	864
Family & Social Services	...	...	...	...	421	579	629	607
Health	...	...	...	...	...	...	2,623	2,737
Hospitals & Medical Care	2,637	2,460	2,480	2,500	2,610	2,619	...	...
Housing	805	739	850	1,316	...	...	...	...
Labour	557	564	591	729	684	614	620	625
Manpower	...	1,539	1,412	1,999	...	...	...	...
Mental Health Research Fund [1]	193	345	311	351	293	304	...	...
Municipal Affairs	1,408	1,577	1,037	870	2,311	2,411	2,865	2,431
Occupational Health & Safety	...	...	...	...	...	...	392	647
Recreation & Parks	511	207	494	250	342	392	825	375
Social Services & Community Health	400	463	507	5,481	...	...	...	...
Solicitor General	3,478	4,434	4,521	2,234	1,617	1,892	2,526	2,289
Tourism	...	...	...	...	637	759	1,920	1,869
Tourism & Small Business	1,597	1,058	713	882	...	...	...	...
Transportation & Utilities	-	377	233	1,571	256	418	510	510
Treasury	1,994	2,097	2,094	2,172	2,267	2,009	1,932	2,188
Workers' Health, Safety & Compensation	808	931	723	1,132	...	...	...	...
TOTAL	**43,838**	**48,841**	**52,061**	**54,825**	**44,435**	**31,347**	**29,446**	**28,580**

1 Included with Department of Health as of 1988-89.

TABLE 47. Total Expenditures in the Social Sciences and Humanities by Performer, 1982-83 to 1989-90

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Intramural	31,396	36,057	42,542	37,096	33,150	24,430	20,754	19,663
Industry	9,050	8,709	5,636	10,540	6,323	3,160	5,139	4,772
Universities	1,859	1,658	2,094	3,533	1,772	1,939	2,094	2,790
Hospitals and health organizations	111	213	114	381	231	123	-	43
Alberta Research Council[1]	5	5	5	86	17	53	5	5
Other	1,417	2,199	1,670	3,189	2,942	1,642	1,454	1,307
TOTAL	**43,838**	**48,841**	**52,061**	**54,825**	**44,435**	**31,347**	**29,446**	**28,580**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 48. Total Expenditures on R&D in the Social Sciences and Humanities by Performer, 1982-83 to 1989-90

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Intramural	300	683	1,265	1,268	3,772	853	2,428	2,554
Industry	521	423	331	411	651	75	1,589	870
Universities	643	1,023	814	1,300	1,042	1,297	476	644
Hospitals and health organizations	111	213	114	381	231	123	-	43
Alberta Research Council[1]	5	5	5	20	-	48	5	5
Other	134	121	219	254	839	177	519	449
TOTAL	**1,714**	**2,468**	**2,748**	**3,634**	**6,535**	**2,573**	**5,017**	**4,565**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 49. Total Expenditures on R&D in the Social Sciences and Humanities by Department or Agency, 1982-83 to 1989-90

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	($'000)							
Advanced Education	-	19	65	488	462	472	238	173
Alcoholism & Drug Abuse Commission	7	1	1	-	-	-	-	84
Attorney General	290	436	407	363	363	326	300	300
Career Development & Employment	...	...	...	...	-	-	19	-
Community & Occupational Health	...	...	...	...	159	266	...	...
Culture & Multiculturalism	296	773	1,464	1,464	3,720	-	1,359	1,293
Education	295e	302	324	526	1,376	753	471	319
Educational Communications Corporation ACCESS	7e	-	31	31	31	-	-	-
Environment	-	-	-	-	-	-	-	-
Family & Social Services	...	...	...	...	20	190	367	367
Health	...	...	...	...	...	...	518	590
Hospitals & Medical Care	111	111	111	111	111	214	...	...
Housing	385	-	-	-	...	...	...	...
Manpower	...	90	-	-	...	...	...	...
Mental Health Research Fund[1]	193	345	311	351	293	304	...	...
Municipal Affairs & Housing	68	53	-	-	...	...	...	...
Occupational Health & Safety	...	...	...	...	...	...	-	230
Tourism	...	...	...	...	-	48	1,745	1,209
Treasury	-	-	-	-	-	-	-	-
Workers' Health, Safety & Compensation	62	338	34	300	...	...	...	...
TOTAL	**1,714**	**2,468**	**2,748**	**3,634**	**6,535**	**2,573**	**5,017**	**4,565**

1 Included with Department of Health as of 1988-89.

TABLE 50. Departmental Personnel Engaged in Scientific Activities in the Social Sciences and Humanities, by Activity and Category, 1982-83 to 1989-90

Activity and category	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90e
	(person-years)							
Research & development:								
Scientific & professional ...	24	16	36	36	44	4	34	34
Technical	2	-	1	1	5	-	27	28
Other	3	5	2	2	4	-	24	23
Sub-total	29	21	39	39	53	4	85	85
Related scientific activities:								
Scientific & professional ...	261	298	405	384	306	258	229	232
Technical	66	56	198	175	95	121	91	91
Other	103	131	188	168	107	103	89	79
Sub-total	430	485	791	727	508	482	409	402
Administration of extramural programs:								
Scientific & professional ...	...	...	...	...	...	8	7	8
Technical	...	...	...	...	...	-	1	2
Other	...	...	...	...	...	8	2	2
Sub-total	...	...	...	...	...	16	10	12
Total scientific activities:								
Scientific & professional ...	285	314	441	420	350	270	270	274
Technical	68	56	199	176	100	121	119	121
Other	106	136	190	170	111	111	115	104
**TOTAL	**459**	**506**	**830**	**766**	**561**	**502**	**504**	**499**

TABLE 51. Total Expenditures in the Social Sciences and Humanities by Department or Agency and Sources of Funds, 1988-89

Department or agency	Departmental budget	Other departments	Federal government	Trust funds	Other sources	Total
	($'000)					
Advanced Education	2,176	-	-	-	-	2,176
Alcoholism & Drug Abuse Commission	577	-	-	-	-	577
Attorney General	300	-	-	-	-	300
Career Development & Employment	1,588	-	-	-	-	1,588
Consumer & Corporate Affairs	98	-	-	-	-	98
Culture & Multiculturalism	2,875	-	60	-	-	2,935
Economic Development and Trade	3,441	-	-	37	-	3,478
Education	2,139	-	-	-	-	2,139
Educational Communications Corporation ACCESS	367	-	-	-	-	367
Environment	7	-	-	-	-	7
Environment Council	939	-	-	-	-	939
Family & Social Services	629	-	-	-	-	629
Health	2,560	-	63	-	-	2,623
Labour	620	-	-	-	-	620
Municipal Affairs	2,865	-	-	-	-	2,865
Occupational Health & Safety	196	-	-	-	196	392
Recreation & Parks	825	-	-	-	-	825
Solicitor General	2,526	-	-	-	-	2,526
Tourism	1,048	-	872	-	-	1,920
Transportation & Utilities	510	-	-	-	-	510
Treasury	1,932	-	-	-	-	1,932
TOTAL	**28,218**	**-**	**995**	**37**	**196**	**29,446**

TABLE 52. Total Expenditures in the Social Sciences and Humanities by Activity and Performer, 1988-89

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Research and development							
Current expenditures:							
In-house	2,130	...	...	...	...	...	2,130
Contracts	122	1,570	92	-	-	119	1,903
Grants	...	19	384	-	5	400	808
Research fellowships	-	-	-	-	-	-	-
Administration of extramural R&D programs	81	...	...	...	...	...	81
Sub-total	2,333	1,589	476	-	5	519	4,922
Capital Expenditures	95	...	...	...	...	...	95
Related scientific activities							
Current expenditures	16,596	3,550	1,618	-	-	935	22,699
Administration of extramural RSA programs	377	...	...	...	...	...	377
Sub-total	16,973	3,550	1,618	-	-	935	23,076
Capital expenditures	1,353	...	...	...	...	...	1,353
TOTAL	**20,754**	**5,139**	**2,094**	**-**	**5**	**1,454**	**29,446**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 53. Total Expenditures in the Social Sciences and Humanities by Department or Agency and Performer, 1988-89

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Advanced Education	492	-	1,494	-	-	190	2,176
Alcoholism & Drug Abuse Commission	577	-	-	-	-	-	577
Attorney General	-	-	-	-	-	300	300
Career Development & Employment	1,132	182	29	-	-	245	1,588
Consumer & Corporate Affairs	75	6	12	-	-	5	98
Culture & Multiculturalism	2,749	160	-	-	-	26	2,935
Economic Development & Trade	2,490	930	20	-	-	38	3,478
Education	1,370	258	190	-	5	316	2,139
Educational Communications Corporation ACCESS	367	-	-	-	-	-	367
Environment	1	6	-	-	-	-	7
Environment Council	939	-	-	-	-	-	939
Family & Social Services	417	80	-	-	-	132	629
Health	1,825	438	297	-	-	63	2,623
Labour	620	-	-	-	-	-	620
Municipal Affairs	2,720	18	-	-	-	127	2,865
Occupational Health & Safety	362	30	-	-	-	-	392
Recreation & Parks	547	214	52	-	-	12	825
Solicitor General	1,577	949	-	-	-	-	2,526
Tourism	378	1,542	-	-	-	-	1,920
Transportation & Utilities	510	-	-	-	-	-	510
Treasury	1,606	326	-	-	-	-	1,932
TOTAL	**20,754**	**5,139**	**2,094**	**-**	**5**	**1,454**	**29,446**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 54. Total Expenditures in the Social Sciences and Humanities by Department or Agency and Activity, 1988-89

Department or agency	Research and development			Related scientific activities			Total
	Current	AEP[1]	Capital	Current	AEP[1]	Capital	
	($'000)						
Advanced Education	237	1	-	1,929	9	-	2,176
Alcoholism & Drug Abuse Commission	-	-	-	577	-	-	577
Attorney General	300	-	-	-	-	-	300
Career Development & Employment	19	-	-	1,569	-	-	1,588
Consumer & Corporate Affairs	-	-	-	98	-	-	98
Culture & Multiculturalism	1,268	-	91	338	-	1,238	2,935
Economic Development & Trade	-	-	-	3,413	20	45	3,478
Education	392	75	4	1,377	275	16	2,139
Educational Communications Corporation ACCESS	-	-	-	350	-	17	367
Environment	-	-	-	7	-	-	7
Environment Council	-	-	-	939	-	-	939
Family & Social Services	367	-	-	262	-	-	629
Health	513	5	-	2,045	60	-	2,623
Labour	-	-	-	620	-	-	620
Municipal Affairs	-	-	-	2,865	-	-	2,865
Occupational Health & Safety	-	-	-	386	-	6	392
Recreation & Parks	-	-	-	825	-	-	825
Solicitor General	-	-	-	2,526	-	-	2,526
Tourism	1,745	-	-	162	13	-	1,920
Transportation & Utilities	-	-	-	510	-	-	510
Treasury	-	-	-	1,901	-	31	1,932
TOTAL	**4,841**	**81**	**95**	**22,699**	**377**	**1,353**	**29,446**

1 Administration of extramural programs.

TABLE 55. Total Expenditures on R&D in the Social Sciences and Humanities by Department or Agency and Performer, 1988-89

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Advanced Education	1	-	137	-	-	100	238
Attorney General	-	-	-	-	-	300	300
Career Development & Employment	-	19	-	-	-	-	19
Culture & Multiculturalism	1,255	104	-	-	-	-	1,359
Education	299	6	42	-	5	119	471
Family & Social Services	287	80	-	-	-	-	367
Health	221	-	297	-	-	-	518
Tourism	365	1,380	-	-	-	-	1,745
TOTAL	**2,428**	**1,589**	**476**	**-**	**5**	**519**	**5,017**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 56. Intramural Expenditures in the Social Sciences and Humanities by Department or Agency and Type of Expenditure, 1988-89

Department or agency	Current expenditures		Capital expenditures	Total
	Personnel costs	Other costs		
	($'000)			
Advanced Education	436	56	-	492
Alcoholism & Drug Abuse Commission	283	294	-	577
Attorney General	-	-	-	-
Career Development & Employment	1,087	45	-	1,132
Consumer & Corporate Affairs	65	10	-	75
Culture & Multiculturalism	1,141	279	1,329	2,749
Economic Development & Trade	2,032	413	45	2,490
Education	1,077	273	20	1,370
Educational Communications Corporation ACCESS	238	112	17	367
Environment	1	-	-	1
Environment Council	779	160	-	939
Family & Social Services	299	118	-	417
Health	1,232	593	-	1,825
Labour	508	112	-	620
Municipal Affairs	2,222	498	-	2,720
Occupational Health & Safety	329	27	6	362
Recreation & Parks	513	34	-	547
Solicitor General	1,577	-	-	1,577
Tourism	378	-	-	378
Transportation & Utilities	310	200	-	510
Treasury	1,342	233	31	1,606
TOTAL	**15,849**	**3,457**	**1,448**	**20,754**

TABLE 57. **Departmental Personnel Engaged in Scientific Activities in the Social Sciences and Humanities by Department or Agency, 1988-89**

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Advanced Education	-	-	-	-	8	-	3	11
Alcoholism & Drug Abuse Commission	-	-	-	-	7	2	1	10
Attorney General	-	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	17	4	5	26
Consumer & Corporate Affairs	-	-	-	-	-	2	-	2
Culture & Multiculturalism	15	24	20	59	14	23	20	57
Economic Development & Trade	-	-	-	-	36	2	9	47
Education	2	-	-	2	9	3	3	15
Educational Communications Corporation - ACCESS	-	-	-	-	3	1	1	5
Environment	-	-	-	-	-	-	-	-
Environment Council	-	-	-	-	10	3	7	20
Family & Social Services	5	-	-	5	3	1	-	4
Health	5	-	1	6	19	-	7	26
Labour	-	-	-	-	6	1	8	15
Municipal Affairs	-	-	-	-	42	9	10	61
Occupational Health & Safety	-	-	-	-	5	-	2	7
Recreation & Parks	-	-	-	-	12	3	-	15
Solicitor General	-	-	-	-	10	34	-	44
Tourism	7	3	3	13	-	-	-	-
Transportation & Utilities	-	-	-	-	2	1	6	9
Treasury	-	-	-	-	26	2	7	35
TOTAL	**34**	**27**	**24**	**85**	**229**	**91**	**89**	**409**

TABLE 57. **Departmental Personnel Engaged in Scientific Activities in the Social Sciences and Humanities by Department or Agency, 1988-89** - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Advanced Education	-	-	-	-	8	-	3	11
Alcoholism & Drug Abuse Commission	-	-	-	-	7	2	1	10
Attorney General	-	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	17	4	5	26
Consumer & Corporate Affairs	-	-	-	-	-	2	-	2
Culture & Multiculturalism	-	-	-	-	29	47	40	116
Economic Development & Trade	-	-	1	1	36	2	10	48
Education	5	1	1	7	16	4	4	24
Educational Communications Corporation - ACCESS	-	-	-	-	3	1	1	5
Environment	-	-	-	-	-	-	-	-
Environment Council	-	-	-	-	10	3	7	20
Family & Social Services	-	-	-	-	8	1	-	9
Health	1	-	-	1	25	-	8	33
Labour	-	-	-	-	6	1	8	15
Municipal Affairs	-	-	-	-	42	9	10	61
Occupational Health & Safety	-	-	-	-	5	-	2	7
Recreation & Parks	-	-	-	-	12	3	-	15
Solicitor General	-	-	-	-	10	34	-	44
Tourism	1	-	-	1	8	3	3	14
Transportation & Utilities	-	-	-	-	2	1	6	9
Treasury	-	-	-	-	26	2	7	35
TOTAL	**7**	**1**	**2**	**10**	**270**	**119**	**115**	**504**

TABLE 58. Objectives of Expenditures in the Social Sciences and Humanities by Department or Agency, 1988-89

Department or agency	Advancement of science	Energy and fuels	Environmental issues	
			Land	Other
	($'000)			
Advanced Education	100	-	-	-
Alcoholism & Drug Abuse Commission	-	-	-	-
Attorney General	-	-	-	-
Career Development & Employment	-	-	-	-
Consumer & Corporate Affairs	-	-	-	-
Culture & Multiculturalism	-	-	-	-
Economic Development & Trade	-	-	31	-
Education	-	-	-	-
Educational Communications Corporation ACCESS	-	-	-	-
Environment	-	5	-	-
Environment Council	-	-	-	939
Family & Social Services	-	-	-	-
Health	-	-	-	-
Labour	-	-	-	-
Municipal Affairs	-	-	-	-
Occupational Health & Safety	-	-	-	-
Recreation & Parks	-	-	-	-
Solicitor General	-	-	-	-
Tourism	-	-	-	-
Transportation & Utilities	-	-	-	-
Treasury	-	-	-	-
TOTAL	**100**	**5**	**31**	**939**

TABLE 58. Objectives of Expenditures in the Social Sciences and Humanities by Department or Agency, 1988-89 - Continued

Department or agency	Health	Industrial and economic development			
		Agriculture	Manufacturing	Minerals	Other
	($'000)				
Advanced Education	-	-	-	-	-
Alcoholism & Drug Abuse Commission	577	-	-	-	-
Attorney General	-	-	-	-	-
Career Development & Employment	-	-	-	-	-
Consumer & Corporate Affairs	-	-	-	-	-
Culture & Multiculturalism	-	-	-	-	-
Economic Development & Trade	-	-	36	582	1,763
Education	-	-	-	-	-
Educational Communications Corporation ACCESS	-	-	-	-	-
Environment	-	1	-	-	-
Environment Council	-	-	-	-	-
Family & Social Services	-	-	-	-	-
Health	2,623	-	-	-	-
Labour	-	-	-	-	-
Municipal Affairs	-	-	-	-	-
Occupational Health & Safety	392	-	-	-	-
Recreation & Parks	-	-	-	-	-
Solicitor General	-	-	-	-	-
Tourism	-	-	-	-	-
Transportation & Utilities	-	-	-	-	-
Treasury	-	-	-	-	-
TOTAL	**3,592**	**1**	**36**	**582**	**1,763**

TABLE 58. Objectives of Expenditures in the Social Sciences and Humanities by Department or Agency, 1988-89 - Concluded

Department or agency	Social development					Transportation	Other	Total
	Culture, sport and recreation	Education	Human resources	Urban and regional studies	Other			
	($'000)							
Advanced Education	-	1,939	-	137	-	-	-	2,176
Alcoholism & Drug Abuse	-	-	-	-	-	-	-	577
Attorney General	-	-	-	-	300	-	-	300
Career Development & Employment	-	1,588	-	-	-	-	-	1,588
Consumer & Corporate Affairs	-	-	-	-	98	-	-	98
Culture & Multiculturalism	2,935	-	-	-	-	-	-	2,935
Economic Development & Trade	79	-	-	-	-	987	-	3,478
Education	-	2,139	-	-	-	-	-	2,139
Educational Communications Corporation ACCESS	-	367	-	-	-	-	-	367
Environment	-	-	-	-	-	-	1	7
Environment Council	-	-	-	-	-	-	-	939
Family & Social Services	-	110	250	-	269	-	-	629
Health	-	-	-	-	-	-	-	2,623
Labour	-	-	620	-	-	-	-	620
Municipal Affairs	-	-	-	2,472	393	-	-	2,865
Occupational Health & Safety	-	-	-	-	-	-	-	392
Recreation & Parks	825	-	-	-	-	-	-	825
Solicitor General	-	-	-	-	2,526	-	-	2,526
Tourism	-	-	-	-	1,920	-	-	1,920
Transportation & Utilities	-	-	-	-	-	510	-	510
Treasury	-	-	-	-	1,932	-	-	1,932
TOTAL	**3,839**	**6,143**	**870**	**2,609**	**7,438**	**1,497**	**1**	**29,446**

TABLE 59. Objectives of Expenditures in the Social Sciences and Humanities by Activity, 1988-89

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	($'000)				
Advancement of science	-	-	100	-	100
Energy & fuels	-	1	-	4	5
Environmental issues:					
Land	-	-	-	31	31
Other	-	939	-	-	939
Health	221	2,543	297	531	3,592
Industrial and economic development:					
Agriculture	-	-	-	1	1
Manufacturing	-	-	-	36	36
Minerals	-	300	-	282	582
Other	-	1,413	-	350	1,763
Social development:					
Culture, sport and recreation	1,255	2,041	104	439	3,839
Education	300	3,061	191	2,591	6,143
Human resources	80	710	80	-	870
Urban and regional studies	-	2,345	137	127	2,609
Other	572	3,686	1,680	1,500	7,438
Transportation	-	1,287	-	210	1,497
Other	-	-	-	1	1
**TOTAL	**2,428**	**18,326**	**2,589**	**6,103**	**29,446**

TABLE 60. Total Expenditures in the Social Sciences and Humanities by Activity and Performer, 1989-90e

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Research and development							
Current expenditures:							
In-house	2,344	...	...	...	...	...	2,344
Contracts	122	870	238	-	-	49	1,279
Grants	...	-	406	-	5	400	811
Research fellowships	-	-	-	43	-	-	43
Administration of extramural R&D programs	86	...	...	...	...	...	86
Sub-total	2,552	870	644	43	5	449	4,563
Capital expenditures	2	...	...	...	...	...	2
Related scientific activities							
Current expenditures	16,516	3,902	2,146	-	-	858	23,422
Administration of extramural RSA programs	430	...	...	...	...	...	430
Sub-total	16,946	3,902	2,146	-	-	858	23,852
Capital expenditures	163	...	...	...	...	...	163
TOTAL	**19,663**	**4,772**	**2,790**	**43**	**5**	**1,307**	**28,380**

[1] Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 61. Total Expenditures in the Social Sciences and Humanities by Department or Agency and Performer, 1989-90a

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Advanced Education	450	-	2,061	-	-	100	2,611
Alcoholism & Drug Abuse Commission	790	-	-	-	-	-	790
Attorney General	-	-	-	-	-	300	300
Career Development & Employment	1,145	176	-	-	-	236	1,557
Consumer & Corporate Affairs	95	20	-	-	-	-	115
Culture & Multiculturalism	1,448	163	-	-	-	27	1,638
Economic Development & Trade	2,783	1,205	20	-	-	50	4,058
Education	1,486	145	175	-	5	439	2,250
Educational Communications Corporation ACCESS	112	-	-	-	-	-	112
Environment	1	6	-	-	-	-	7
Environment Council	864	-	-	-	-	-	864
Family & Social Services	397	80	-	-	-	130	607
Health	1,960	400	334	43	-	-	2,737
Labour	625	-	-	-	-	-	625
Municipal Affairs	2,206	200	-	-	-	25	2,431
Occupational Health & Safety	412	35	200	-	-	-	647
Recreation & Parks	286	89	-	-	-	-	375
Solicitor General	1,626	663	-	-	-	-	2,289
Tourism	610	1,259	-	-	-	-	1,869
Transportation & Utilities	510	-	-	-	-	-	510
Treasury	1,857	331	-	-	-	-	2,188
TOTAL	**19,663**	**4,772**	**2,790**	**43**	**5**	**1,307**	**28,380**

1 Includes only annual funding by Government of Alberta - other funds are not included.

TABLE 62. Total Expenditures in the Social Sciences and Humanities by Department or Agency and Activity, 1989-90a

Department or agency	Research and development			Related scientific activities			Total
	Current	AEP[1]	Capital	Current	AEP[1]	Capital	
	($'000)						
Advanced Education	172	1	-	2,429	9	-	2,611
Alcoholism & Drug Abuse Commission	84	-	-	706	-	-	790
Attorney General	300	-	-	-	-	-	300
Career Development & Employment	-	-	-	1,557	-	-	1,557
Consumer & Corporate Affairs	-	-	-	115	-	-	115
Culture & Multiculturalism	1,293	-	-	345	-	-	1,638
Economic Development & Trade	-	-	-	3,986	26	46	4,058
Education	267	50	2	1,626	300	5	2,250
Educational Communications Corporation ACCESS	-	-	-	112	-	-	112
Environment	-	-	-	7	-	-	7
Environment Council	-	-	-	864	-	-	864
Family & Social Services	367	-	-	240	-	-	607
Health	585	5	-	2,127	20	-	2,737
Labour	-	-	-	625	-	-	625
Municipal Affairs	-	-	-	2,381	50	-	2,431
Occupational Health & Safety	200	30	-	410	-	7	647
Recreation & Parks	-	-	-	375	-	-	375
Solicitor General	-	-	-	2,289	-	-	2,289
Tourism	1,209	-	-	635	25	-	1,869
Transportation & Utilities	-	-	-	490	-	20	510
Treasury	-	-	-	2,103	-	85	2,188
TOTAL	**4,477**	**86**	**2**	**23,422**	**430**	**163**	**28,580**

1 Administration of extramural programs.

TABLE 63. Total Expenditures on R&D in the Social Sciences and Humanities by Department or Agency and Performer, 1989-90e

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council[1]	Other	Total
	($'000)						
Advanced Education	1	-	72	-	-	100	173
Alcoholism & Drug Abuse Commission	84	-	-	-	-	-	84
Attorney General	-	-	-	-	-	300	300
Culture & Multiculturalism	1,187	106	-	-	-	-	1,293
Education	202	25	38	-	5	49	319
Family & Social Services	287	80	-	-	-	-	367
Health	213	-	334	43	-	-	590
Occupational Health & Safety	30	-	200	-	-	-	230
Tourism	550	659	-	-	-	-	1,209
TOTAL	**2,554**	**870**	**644**	**43**	**5**	**449**	**4,565**

1 Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 54. Departmental Personnel Engaged in Scientific Activities in the Social Sciences and Humanities by Department or Agency, 1989-90e

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Advanced Education	-	-	-	-	8	-	3	11
Alcoholism & Drug Abuse Commission	-	2	-	2	7	3	1	11
Attorney General	-	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	17	4	5	26
Consumer & Corporate Affairs	-	-	-	-	-	2	-	2
Culture & Multiculturalism	15	24	20	59	14	23	20	57
Economic Development & Trade	-	-	-	-	37	2	7	46
Education	2	-	-	2	8	3	3	14
Educational Communications Corporation ACCESS	-	-	-	-	1	1	-	2
Environment	-	-	-	-	-	-	-	-
Environment Council	-	-	-	-	10	3	7	20
Family & Social Services	4	-	-	4	3	1	-	4
Health	6	-	-	6	26	-	7	33
Labour	-	-	-	-	9	3	3	15
Municipal Affairs	-	-	-	-	44	6	9	59
Occupational Health & Safety	-	-	-	-	5	-	2	7
Recreation & Parks	-	-	-	-	5	3	-	8
Solicitor General	-	-	-	-	10	34	-	44
Tourism	7	2	3	12	-	-	-	-
Transportation & Utilities	-	-	-	-	2	1	6	9
Treasury	-	-	-	-	26	2	6	34
TOTAL	**34**	**28**	**23**	**85**	**232**	**91**	**79**	**402**

TABLE 64. Departmental Personnel Engaged in Scientific Activities in the Social Sciences and Humanities by Department or Agency, 1989-90e - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Advanced Education	-	-	-	-	8	-	3	11
Alcoholism & Drug Abuse Commission	-	-	-	-	7	5	1	13
Attorney General	-	-	-	-	-	-	-	-
Career Development & Employment	-	-	-	-	17	4	5	26
Consumer & Corporate Affairs	-	-	-	-	-	2	-	2
Culture & Multiculturalism	-	-	-	-	29	47	40	116
Economic Development & Trade	-	-	-	-	37	2	7	46
Education	4	1	1	6	14	4	4	22
Educational Communications Corporation ACCESS	-	-	-	-	1	1	-	2
Environment	-	-	-	-	-	-	-	-
Environment Council	-	-	-	-	10	3	7	20
Family & Social Services	-	-	-		7	1	-	8
Health	1	-	-	1	33	-	7	40
Labour	-	-	-	-	9	3	3	15
Municipal Affairs	-	1	-	1	44	7	9	60
Occupational Health & Safety	1	-	1	2	6	-	3	9
Recreation & Parks	-	-	-	-	5	3	-	8
Solicitor General	-	-	-	-	10	34	-	44
Tourism	2	-	-	2	9	2	3	14
Transportation & Utilities	-	-	-	-	2	1	6	9
Treasury	-	-	-	-	26	2	6	34
TOTAL	**8**	**2**	**2**	**12**	**274**	**121**	**104**	**499**

TABLE 65. Objectives of Expenditures in the Social Sciences and Humanities by Department or Agency, 1989-90a

Department or agency	Advancement of science	Energy & fuels	Environmental issues	
			Water	Other
	($'000)			
Advanced Education	100	-	-	-
Alcoholism & Drug Abuse Commission	-	-	-	-
Attorney General	-	-	-	-
Career Development & Employment	-	-	-	-
Consumer & Corporate Affairs	-	-	-	-
Culture & Multiculturalism	-	-	-	-
Economic Development & Trade	-	-	-	-
Education	-	-	-	-
Educational Communications Corporation ACCESS	-	-	-	-
Environment	-	5	-	-
Environment Council	-	-	-	864
Family & Social Services	-	-	-	-
Health	-	-	-	-
Labour	-	-	-	-
Municipal Affairs	-	-	-	-
Occupational Health & Safety	-	-	-	-
Recreation & Parks	-	-	-	-
Solicitor General	-	-	-	-
Tourism	-	-	-	-
Transportation & Utilities	-	-	-	-
Treasury	-	-	-	-
TOTAL	**100**	**5**	**-**	**864**

TABLE 65. Objectives of Expenditures in the Social Sciences and Humanities by Department or Agency, 1989-90a - Continued

Department or agency	Health	Industrial and economic development			
		Agriculture	Manufacturing	Minerals	Other
	($'000)				
Advanced Education	-	-	-	-	-
Alcoholism & Drug Abuse Commission	790	-	-	-	-
Attorney General	-	-	-	-	-
Career Development & Employment	-	-	-	-	-
Consumer & Corporate Affairs	-	-	-	-	-
Culture & Multiculturalism	-	-		-	-
Economic Development & Trade	-	-	380	528	1,831
Education	-	-	-	-	-
Educational Communications Corporation ACCESS	-	-	-	-	-
Environment	-	1	-	-	1
Environment Council	-	-	-	-	-
Family & Social Services	-	-	-	-	-
Health	2,737	-	-	-	-
Labour	-	-	-	-	-
Municipal Affairs	-	-	-	-	-
Occupational Health & Safety	647	-	-	-	-
Recreation & Parks	-	-	-	-	-
Solicitor General	-	-	-	-	-
Tourism	-	-	-	-	-
Transportation & Utilities	-	-	-	-	-
Treasury	-	-	-	-	-
TOTAL	**4,174**	**1**	**380**	**528**	**1,831**

TABLE 65. Objectives of Expenditures in the Social Sciences and Humanities by Department or Agency, 1989-90a - Concluded

Department or agency	Social development					Transportation	Other	Total
	Culture, sport and recreation	Education	Human resources	Urban and studies	Other			
	($'000)							
Advanced Education	800	1,639	-	-	72	-	-	2,611
Alcoholism & Drug Abuse Commission	-	-	-	-	-	-	-	790
Attorney General	-	-	-	-	300	-	-	300
Career Development & Employment	-	-	1,557	-	-	-	-	1,557
Consumer & Corporate Affairs	-	-	-	-	115	-	-	115
Culture & Multiculturalism	1,638	-	-	-	-	-	-	1,638
Economic Development & Trade	-	-	-	-	-	1,319	-	4,058
Education	-	2,250	-	-	-	-	-	2,250
Educational Communications Corporation ACCESS	-	112	-	-	-	-	-	112
Environment	-	-	-	-	-	-	1	7
Environment Council	-	-	-	-	-	-	-	864
Family & Social Services	-	110	250	-	247	-	-	607
Health	-	-	-	-	-	-	-	2,737
Labour	-	-	625	-	-	-	-	625
Municipal Affairs	-	-	-	2,431	-	-	-	2,431
Occupational Health & Safety	-	-	-	-	-	-	-	647
Recreation & Parks	375	-	-	-	-	-	-	375
Solicitor General	-	-	-	-	2,289	-	-	2,289
Tourism	-	-	-	-	1,869	-	-	1,869
Transportation & Utilities	-	-	-	-	-	510	-	510
Treasury	-	-	1,420	-	-	-	768	2,188
TOTAL	**2,813**	**4,111**	**3,852**	**2,431**	**4,892**	**1,829**	**769**	**28,530**

TABLE 66. Objectives of Expenditures in the Social Sciences and Humanities by Activity, 1989-90e

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	($'000)				
Advancement of science	-	-	100	-	100
Energy & fuels	-	1	-	4	5
Environmental issues:					
Water	-	-	-	-	-
Other	-	864	-	-	864
Health	327	2,835	577	435	4,174
Industrial and economic development:					
Agriculture	-	1	-	-	1
Manufacturing	-	200	-	180	380
Minerals	-	228	-	300	528
Other	-	1,471	-	360	1,831
Social development:					
Culture, sport and recreation	1,187	547	106	973	2,813
Education	203	1,845	117	1,946	4,111
Human resources	80	3,280	80	412	3,852
Urban and regional studies .	-	2,206	-	225	2,431
Other	757	1,801	1,031	1,303	4,892
Transportation	-	1,393	-	436	1,829
Other	-	437	-	332	769
**TOTAL	**2,554**	**17,109**	**2,011**	**6,906**	**28,580**

APPENDIX

DEFINITIONS

This report covers those scientific and technological activities which involve the generation, dissemination and application of new scientific and technological knowledge. The central activity is research and experimental development (R&D). In addition, there are a number of related scientific activities (RSA) which are considered in less detail.

R&D is creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humans, culture and society and the use of this stock of knowledge to devise new applications. It requires the acquisition of knowledge and not just information. New knowledge involves the integration of newly acquired information into existing hypotheses, the formulation and testing of new hypotheses or the re-evaluation of existing observations.

The major **related scientific activities (RSA)** are education support, technical surveys, statistical surveys, information services, special services and studies, and museum services. Education support, statistical surveys, and museum services are largely self-explanatory the other three are described below.

Technical surveys are activities directed towards the exploration and systematic description of the earth and its natural resources. The activities include the gathering, processing, collating and analyzing of data on natural phenomena except when part of a research project or a museum service. The preparation of maps and survey reports, their printing and cataloguing, are also included.

Information services are activities directed to recording, classifying, translating, and disseminating scientific and technological information **(Technology Transfer)** as well as information resulting from R&D in the social sciences or required in support of such R&D. Included are the operating of scientific and technical libraries, specialized libraries and archives, the publication of scientific journals and bibliographies, and the organization of scientific conferences. Grants for the publication of scholarly works are also included.

Special services and studies in the natural sciences are activities directed towards the establishment of national and provincial standards for materials, devices, products and processes; the calibration of secondary standards; non-routine quality testing; feasibility studies and demonstration projects. In the social sciences, special services and studies are systematic investigations carried out in order to provide information needed for planning or policy formulation, including feasibility studies, and demonstration projects.

Activities are either natural sciences or social sciences and humanities. **Natural sciences** consist of disciplines concerned with the understanding, exploring, developing or utilizing the natural world. Included are the engineering, mathematical, environmental, life and physical sciences. **Social sciences and humanities** include all disciplines involving the study of human actions and conditions and the social, economic and institutional mechanisms affecting humans. Included are such disciplines as anthropology, business administration and commerce, communications, criminology, demography, economics, geography, history, languages, literature and linguistics, law, library science, philosophy, political science, psychology, religious studies, social work, sociology and urban and regional studies.

Five **performing sectors** are identified besides the Alberta Research Council. **Intramural** refers to the provincial department or agency performing a scientific activity. **Industry** consists principally of private corporations but also includes crown corporations with a commercial function (e.g., power utilities) and industrial research institutes not controlled by another sector. **Universities** cover postsecondary educational institutions and affiliated teaching and research facilities. **Hospitals and health organizations** are health organizations such as the Heart Foundation and hospitals which do not belong to the university sector. **Other** includes non-resident performers of scientific activities funded by the provincial government, as well as recipients not covered elsewhere such as the Federal Government, other provincial departments and individuals.

Expenditures are either current or capital. **Current expenditures** include those costs for personnel, transportation and communications, information, professional and special services, rentals, purchased repair and upkeep, utilities, materials and supplies. **Capital expenditures** are those on the construction and acquisition of land, buildings, machinery and equipment. Total expenditures include current plus capital.

RESPONDENTS
1988-89

The following Departments are currently involved in scientific activities in the province of Alberta. The coordinator listed is the person responsible for the expenditures reported. We wish to thank the coordinators, as well as those who assisted in the amalgamation of data, for their time and efforts in providing these statistics.

Advanced Education — Coordinator: Asefa Gabregiorgis (422-4845)

Research and Information Support is responsible for the collection and analysis of data for the development of long range plans and policies in the area of advenced education. The other major activity is the operation of the Innovative Projects grant program to support the development and demonstration of innovative instructional techniques. R&D grants, awarded to Researchers in Alberta universities and health organizations through the Alberta Foundation for Nursing Research previously included with Advanced Education are now reported by Technology Research & Telecommunications. Special Purpose Grants are awarded to private non-profit foundations and research institutes to examine various aspects of public policy.

Agriculture — Coordinator: Dr. Ralph G. Christian (422-1072)

The Department operates a number of research centres in Alberta, as well as supporting agriculture related research projects undertaken by universities and provincial research organizations.

Alcoholism and Drug Abuse Commission — Coordinator: Art Dyer (427-4275)

The Commission carries out or funds studies required for program evaluation, policy analysis and needs assessments.

Attorney General — Coordinator: D. Chow (427-4997)

The Department makes an annual research grant to the Institute of Law Research and Reform at the University of Alberta.

Career Development and Employment — Coordinator: Joe Hammond (427-8501)

The Labour Market Information and Planning Division is responsible for the provision of a wide range of planning, research, policy analysis and evaluation services which assist the Department in the development and implementation of its policies, programs and services throughout the Province.

Consumer and Corporate Affairs — Coordinator: Pam McHugh (427-6941)

The Corporate Planning and Consumer Education Divisions conduct program evaluations, policy analysis and needs assessments in support of departmental programs.

RESPONDENTS - Continued

Culture & Multiculturalism — Coordinator: Ken Maclean (427-2921)

The social science activities were reported as a composite of Historic Site Service, Archaeological Survey, Provincial Archives, Reynolds-Alberta Museum, Historical Resources Division and Library. The natural sciences were reported by the Natural History Sector of the Provincial Museum and the Tyrell Museum of Palaeontology.

Economic Development and Trade — Coordinator: Marie Juengel (427-0675)

Eight branches are involved in related scientific activities: Commissioner General for Trade and Tourism, Finance and Administration, Futures Compemdium, Industry Development, Trade Development, Strategic Planning, Transportation Services and Small Business Development. The activities undertaken and funded were special services and studies and statistical studies to provide information for economic planning and policy formation.

Education — Coordinator: Pat Ehman (427-2991)

The Planning and Policy Secretariat is involved chiefly with issue-oriented research of a cross-sectional nature as well as studies and surveys.

ACCESS Educational Communications Corporation — Coordinator: Junichi Kawashima (451-7244)

The Planning, Marketing and Program Research Branch carries out or funds related scientific activities.

Energy — Coordinator: Mr. R.D. McDonald (427-8042)

The Scientific and Engineering Services and Research Division supports a large volume of R&D activity, funded mainly through the Alberta/Canada Energy Resources Research Fund. Projects relate to furthering the development and use of energy resources with emphasis on coal, renewables and energy conservation.

Environment — Coordinator: Sharon Steinbach (632-6761)

Most of the activity is in the Natural Sciences with eight programs reporting: Planning Division, Corporate & Strategic Management, Development & Operations, Standards & Approvals, Research Technical Advisory Committee, River Engineering Branch, Hydro Geology Branch and Surveys Branch. The latter three are part of Technical Services Division. A small amount of activity in the social sciences is reported by the Planning division.

Alberta Environmental Centre — Coordinator: Shanon Steinbach (632-6761)

The Centre is an inter-disciplinary research and service agency which studies and solves environmental problems identified by departments and agencies of the Government of Alberta.

RESPONDENTS - Continued

Environment Council of Alberta — Coordinator: Mr. A. Giacomazzi (427-5792)

The Council offers support through library services and panels. It prepares reports and recommendations and provides information for various public hearings and policy formulating projects.

Family & Social Services — Coordinator: Cathy Yamada (441-6752)

The projects mainly include systematic investigations in order to provide information for planning and policy formulation on human resources, child welfare and services to the handicapped.

Forestry, Lands and Wildlife — Coordinator: Mr. N. Brownlee (962-8700)

Scientific expenditures were reported by five divisions: Alberta Forest Service, Fish and Wildlife Division, Public Lands Division, Forest Industry and Development Division and the Alberta Land Information Services Division.

Alberta Heritage Foundation for Medical Research — Coordinator: A.J. Nykolyn (423-5727)

The Foundation, supported by an endowment fund, supports medical research based in Alberta.

Health — Coordinator: Dr. Y.M. Cheung (427-1420)

The branches reporting scientific activities include Health Economics and Statistics Branch, Hospital Services Branch, Systems Consulting Services Branch, and Research and Strategic Planning Branch. The Advisory & Appeals Secretariat administers the Alberta Mental Health Research Funds. This Fund awards grants and contributions to Universities for health related research and development in both natural and social sciences.

Labour — Coordinator: Janet E. Howell (427-8531)

Wages and benefits as well as other labour information is studied and analyzed. The results are made available for policy planning as well as the development of safety standards.

Municipal Affairs — Coordinator: Linden Holmen (427-8150)

The Research and Development Section of Housing Division manages the Innovative Housing Grant Program (I.H.G.P.) which provides grants to industry, institutions and individuals to carry out research pertaining to housing.

Alberta Oil Sands Technology and Research Authority — Coordinator: Mr. W.G. Kowaluk (427-7623)

Alberta Heritage Trust is the primary source of funds for AOSTRA which awards numerous contracts for research and development. The industrial sector receives the majority of the money with universities and the Alberta Research Council getting the remainder.

RESPONDENTS - Continued

Occupational Health & Safety — Coordinator: Jill Mercer (427-6971)

The Occupational Health and Safety Heritage Grant Program, supports applied research projects and the development of innovative educational programs aimed at the reduction of work-related injuries and illnesses. Activities in the social sciences included studies on issues in occupational health and safety such as lost-time claims and fatalities and accident types.

Recreation and Parks — Coordinator: Mike Boyd (422-1730)

The major objective reported by this Department for both the natural and social sciences is development in the area of culture, sport and recreation.

Solicitor General — Coordinator: Joe Wong (427-0734)

The Computer and Research Services Branch develops information systems and conducts research in criminal justice.

Technology, Research and Telecommunications — Coordinator: Cathy Haney (422-0561)

The department provides financial assistance in support of research and development (R&D) to the university and industrial sectors. It is the main source of provincial funding for the Alberta Research Council. Other activities include the transfer and commercialization of new technology.

Tourism — Coordinator: Rosemarie Zwarych (427-4837)

The projects involve evaluations, studies and surveys on tourism. These related scientific activities are carried out by both departmental personnel as well as those working in the industrial sector.

Transportation & Utilities — Coordinator: Alan Mah (422-2750)

Most of the activity is in natural sciences with eight programs reporting. These include Research and Development, Materials Engineering Branch, Bridge Engineering Branch, Business and Statistical Analysis Branch, Traffic Engineering, Roadway Planning Branch and Regional Transportation Services. Only Planning & Statistics Branch of Motor Transport Services Division reports some related scientific activites in the social sciences. This is due to the technical and engineering aspects of the work relating to transportation.

Alberta Treasury — Coordinator: Greg Jones (427-3058)

The Alberta Bureau of Statistics collects, compiles, analyses, abstracts and publishes statistical information relative to the commercial, industrial, financial, social, economic and general activities and conditions of the province.

INDICATORS OF PROVINCIAL SCIENTIFIC ACTIVITIES

1. Economic Indicators

Province	Population January/89[1]		Provincial Gross Domestic Product per capita 1987[1]		Gross Domestic Expenditures on Research and development, 1987[2]		Provincial GERD/PGDP 1987-88	
	(000)	Rank	($)	Rank	($'000,000)	Rank	(%)	Rank
Newfoundland	569	9	12,545	9	70	9	1.0	4
Prince Edward Island	130	10	12,369	10	13	10	0.8	9
Nova Scotia	885	7	15,112	7	159	6	1.2	3
New Brunswick	716	8	14,788	8	89	8	0.8	8
Québec	6,668	2	19,769	4	1,713	2	1.3	2
Ontario	9,514	1	23,615	2	4,010	1	1.8	1
Manitoba	1,082	5	18,530	5	186	5	0.9	5
Saskatchewan	1,007	6	17,171	6	148	7	0.9	7
Alberta	**2,415**	**4**	**24,423**	**1**	**546**	**3**	**0.9**	**6**
British Columbia	3,029	3	20,349	3	459	4	0.7	10
Canada[3]	**26,094**		**21,055**		**7,395**		**1.4**	

1 **Canadian Economic Observer,** Statistics Canada, Catalogue No. 11-010, July 1989

2 **Indicators of Science and Technology,** Catalogue No. 88-002, Vol. 1, No. 2, October 1989.

3 Includes the Yukon and Northwest Territories.

2. Higher Education

Province	Total research and development expenditures in the higher education sector, 1987-88[1]			Sponsored research in universities, 1987-88[2]		
	($'000,000)	Per capita ($)	Rank	($'000,000)	Per capita ($)	Rank
Newfoundland	35	61	5	15	26	8
Prince Edward Island	3	23	10	1	8	10
Nova Scotia	57	64	4	29	33	6
New Brunswick	29	40	9	14	19	9
Québec	390	58	6	304	46	1
Ontario	710	74	3	398	42	3
Manitoba	81	75	2	40	37	4
Saskatchewan	52	52	7	35	35	5
Alberta	**226**	**94**	**1**	**108**	**45**	**2**
British Columbia	136	45	8	87	29	7
Canada	**1,719**	**66**		**1,031**	**39**	

1 **Estimation of Research and Development Expenditures in the Higher Education Sector, 1987-88,** July, 1989, Services, Science and Technology Division, Statistics Canada, ST-89-05.

2 **Financial Statistics of Universities and Colleges, 1987-88,** Canadian Association of University Business Officers.

3. Industry

Province	Value added by manufacturing activity per capita, 1986[1]		Current intramural industrial R&D expenditures per employee in primary and secondary industry, 1987[2]	
	($)	Rank	($)	Rank
Newfoundland	1,176	8	19	10
Prince Edward Island	823	10	100	8
Nova Scotia	2,063	6	130	7
New Brunswick	2,143	5	85	9
Québec	3,924	2	941	2
Ontario	5,764	1	1,237	1
Manitoba	2,225	4	134	6
Saskatchewan	1,122	9	184	5
Alberta	**2,062**	**7**	**443**	**3**
British Columbia	2,901	3	401	4
Canada[3]	**3,927**		**852**	

1 **Manufacturing Industries of Canada; National and Provincial Areas, 1986,** Statistics Canada, Catalogue No. 31-203.
2 Results of 1987 Industrial R&D survey, Services, Science and Technology Division, Statistics Canada and **The Labour Force, July, 1989,** Statistics Canada, Catalogue No. 71-001.
3 Includes the Yukon and Northwest Territories.

4. Federal Government

Province	Total intramural expenditures on scientific activities 1987-88[1]	Total Federal scientific personnel 1987-88[2]	Total extramural payments on scientific activities 1987-88[1]
	($'000,000)	(Person-years)	($'000,000)
Newfoundland	50	556	19
Prince Edward Island	8	139	8
Nova Scotia	131	1,733	52
New Brunswick	37	581	18
Québec	314	4,046	463
Ontario	1,495	20,906	601
Manitoba	93	1,643	46
Saskatchewan	51	755	39
Alberta	**104**	**1,512**	**85**
British Columbia	136	1,750	165
Canada[3]	**2,443**	**33,831**	**1,505**

1 **Science Statistics,** Catalogue No. 88-001, Vol. 13, No. 1, June 1989.
2 **Staff and Expenditures of Federal Scientific Establishments 1987-88,** July 1989, Services, Science and Technology Division, Statistics Canada, ST-89-06.
3 Includes the Yukon and Northwest Territories.

5. Provincial

Province	Total provincial expenditures on scientific activities, 1987-88[1]			Total scientific expenditures of Provincial Research Organizations, 1987[2]	
	($'000)	Per capita ($)	Rank	($'000)	Rank
Newfoundland	27,674	49	2	...	...
Nova Scotia	37,683	42	4	6,763	7
New Brunswick	22,715	32	8	8,837	6
Québec	...	...	...	28,563	2
Ontario	358,296	38	5	26,024	3
Manitoba	36,859	34	7	5,477	8
Saskatchewan	47,141	47	3	16,355	4
Alberta	**242,911**	**100**	**1**	**43,476**	**1**
British Columbia	113,199	37	6	8,569	5
Total				**141,064**	

1 **Scientific and Technological Activities of Provincial Governments, 1981-82 to 1988-89**, Services, Science and Technology Division, Statistics Canada, May 1989, ST-89-02.

2 Results of the 1987 survey of Provincial Research Organizations, Services, Science and Technology Division, Statistics Canada.

6. Gross Domestic Expenditures on R&D in Canada, by Performing Sector, by Province, 1987[1]

Province	Federal government	Provincial government	Provincial research organization	Total government	Industry	University	Private non-profit	All sectors
	($'000,000)							
Newfoundland	24	4	-	28	7	35	-	70
Prince Edward Island	7	-	-	7	3	3	-	13
Nova Scotia	71	3	3	77	24	57	1	159
New Brunswick	26	2	3	31	28	29	1	89
Québec	157	45	21	223	1,063	390	37	1,713
Ontario	744	56	12	812	2,440	710	48	4,010
Manitoba	70	1	2	73	28	81	4	186
Saskatchewan	39	3	6	48	48	52	-	148
Alberta	**59**	**22**	**27**	**108**	**211**	**227**	-	**546**
British Columbia	83	15	3	101	216	136	6	459
Canada[2]	**1,281**	**151**	**77**	**1,509**	**4,069**	**1,720**	**97**	**7,395**

1 **Estimates of Canadian Research and Development Expenditures (GERD), National 1963 to 1989, and by Region 1979 to 1987**, Services, Science and Technology Division, Statistics Canada, August 1989, ST-89-08.

2 Includes the Yukon and Northwest Territories.

7. Gross Domestic Expenditures on R&D in Canada, by Funding Sector, by Province, 1987[1]

Province	Federal government	Provincial government	Provincial research organization	Total government	Industry	University	Private non-profit	All sectors[3]
	($'000,000)							
Newfoundland	36	4	-	40	7	21	1	70
Prince Edward Island .	10	-	-	10	1	2	-	13
Nova Scotia	103	5	-	108	17	27	4	159
New Brunswick	39	5	-	44	17	15	-	89
Québec	483	175	-	658	834	82	39	1,713
Ontario	1,174	136	-	1,310	1,769	322	67	4,010
Manitoba	96	7	-	103	28	41	12	186
Saskatchewan	64	18	-	82	45	17	2	148
Alberta	**113**	**98**	**2**	**213**	**196**	**119**	**9**	**546**
British Columbia	190	29	-	219	170	49	12	459
Canada[2]	**2,309**	**477**	**2**	**2,788**	**3,085**	**695**	**146**	**7,395**

1 **Estimates of Canadian Research and Development Expenditures (GERD), National 1963 to 1989, and by Region 1979 to 1987,** Services, Science and Technology Division, Statistics Canada, August 1989, ST-89-08.

2 Includes the Yukon and Northwest Territories.

3 Includes Foreign sources of funds.

8. Gross Domestic Expenditures on R&D in Alberta, 1987[1]

Funding sector	Performing sector: Government				Business enterprise	Higher education	Private non-profit	Total
	Federal	Provincial	ARC	Total				
		($'000,000)						
Government								
Federal	59	-	1	60	6	47	-	**113**
Provincial	-	22	21	43	16	39	-	**98**
PRO	-	-	2	2	-	-	-	**2**
Sub-total	59	22	24	105	22	86	-	**213**
Business enterprise	-	-	3	3	181	12	-	**196**
Higher education	-	-	-	-	-	119	-	**119**
Private non-profit	-	-	-	-	-	9	-	**9**
Foreign	-	-	-	-	8	1	-	**9**
Total	**59**	**22**	**27**	**108**	**211**	**227**	**-**	**546**

1 **Estimates of Canadian Research and Development Expenditures (GERD), National 1963 to 1989, and by Region 1979 to 1987,** Services, Science and Technology Division, Statistics Canada, August 1989, ST-89-08.

9. Federal Government Grants and Contracts to Industry for R&D in the Natural Sciences, by Selected Department/Program and Region, 1987-88[1]

Department/Program	NFLD	PEI	NS	NB	QUE	ONT	MAN	SASK	ALTA	BC	CANADA[2]
	($'000,000)										
A. R&D Grants:											
Regional Industrial Expansion:											
Industrial and Regional Development Program	--	-	-	-	17.8	10.9	-	-	-	-	28.7
Defence Industry Productivity Program	-	-	5.9	-	83.9	52.3	-	-	-	6.3	148.4
Other	--	-	-	--	4.6	5.3	--	--	--	--	10.1
Sub-total	--	-	5.9	--	106.4	68.5	--	--	--	6.3	187.2
National Research Council:											
Industrial Research Assistance Program	0.7	1.2	1.6	1.4	11.1	22.4	1.8	1.7	**3.8**	5.6	51.3
Other	0.3	-	0.1	0.2	10.0	2.8	0.9	0.1	**0.4**	0.4	15.3
Sub-total	1.0	1.2	1.7	1.6	21.1	25.2	2.7	1.8	**4.2**	6.0	66.6
Other	-	1.9	0.1	0.3	24.3	10.9	0.5	2.1	**1.3**	2.4	43.8
**Total	**1.0**	**3.1**	**7.8**	**1.9**	**151.8**	**104.7**	**3.2**	**3.9**	**5.5**	**14.7**	**297.6**
B. R&D Contracts:											
National Defence	0.1	-	2.1	--	9.1	67.7	6.0	0.1	**1.8**	3.1	90.0
National Research Council	0.5	-	-	-	1.0	24.1	0.9	6.1	-	-	32.6
Supply and Services	0.2	-	0.8	-	0.9	3.2	0.3	0.1	**0.6**	5.5	11.6
Other	1.0	0.3	4.0	0.9	17.4	29.2	2.0	1.3	**5.1**	7.5	68.7
**Total	**1.8**	**0.3**	**6.9**	**0.9**	**28.4**	**124.2**	**9.2**	**7.5**	**7.5**	**16.1**	**202.9**
**Total, grants and contracts	**2.8**	**3.4**	**14.6**	**2.8**	**180.2**	**228.9**	**12.4**	**11.4**	**13.0**	**30.8**	**500.5**

1 **Science Statistics**, Catalogue No. 88-001, Vol. 13, No. 1, June 1989.

2 Includes Yukon and Northwest Territories.

The data expressed here are regional representations and will not correspond to Canada aggregates shown in other Statistics Canada publications. Total may not add due to rounding.

10. Federal Government Expenditures on Activities in the Natural Sciences, by Region and Selected Departments, 1987-88[1]

Region	Agriculture	Energy, Mines and Resources	Environment	Fisheries and Oceans	Regional Industrial Expansion	National Research Council	Natural Sciences and Engineering Research Council	Other	Total
	($'000,000)								
Newfoundland	2	3	5	26	-	10	5	9	60
Prince Edward Island .	7	5	1	-	-	1	-	1	15
Nova Scotia	9	17	16	57	6	12	10	30	157
New Brunswick	9	2	6	12	1	2	6	12	50
Québec	29	40	54	20	109	57	72	240	621
Ontario	111	219	140	24	89	283	144	516	1,526
Manitoba	24	1	18	11	--	8	10	54	126
Saskatchewan	25	7	13	-	--	20	10	8	83
Alberta	**28**	**23**	**32**	**-**	**1**	**5**	**30**	**53**	**172**
British Columbia	19	14	37	41	6	42	42	69	270
Canada[2]	**263**	**338**	**334**	**191**	**212**	**440**	**329**	**993**	**3,100**

1 **Federal Government Science Expenditures by Region, 1982-83 to 1987-88**, Services, Science and Technology Division, Statistics Canada, June 1989.

2 Includes Yukon and Northwest Territories.

11. Federal Government Intramural Expenditures on Activities in the Natural Sciences, by Region and Selected Departments, 1987-88[1]

Region	Agriculture	Atomic Energy of Canada Ltd	Energy, Mines and Resources	Environment	Fisheries and Oceans	National Defence	National Research Council	Other	Total
	($'000,000)								
Newfoundland	2	-	-	5	26	-	8	4	45
Prince Edward Island ..	6	-	-	1	-	-	-	1	8
Nova Scotia	8	-	14	15	53	15	9	1	115
New Brunswick	9	-	-	6	12	-	-	8	35
Québec	28	-	14	53	19	40	33	41	228
Ontario	110	78	192	132	24	50	231	204	1,021
Manitoba	22	34	-	17	10	-	4	-	87
Saskatchewan	21	-	3	12	-	-	11	1	48
Alberta	**28**	**-**	**18**	**30**	**-**	**16**	**-**	**7**	**99**
British Columbia	19	-	8	27	38	17	9	9	127
Canada[2]	**253**	**112**	**256**	**310**	**183**	**138**	**305**	**277**	**1,832**

1 **Federal Government Science Expenditures by Region, 1982-83 to 1987-88**, Services, Science and Technology Division, Statistics Canada, June 1989.

2 Includes Yukon and Northwest Territories.

12. Federal Government Intramural Expenditures on R&D in the Natural Sciences, by Region and Selected Departments, 1987-88[1]

Region	Agriculture	Atomic Energy of Canada Ltd	Energy, Mines and Resources	Environment	Fisheries and Oceans	National Defence	National Research Council	Other	Total
	($'000,000)								
Newfoundland	2	-	-	-	10	-	7	3	22
Prince Edward Island ..	6	-	-	-	-	-	-	1	7
Nova Scotia	8	-	1	1	32	15	8	-	65
New Brunswick	8	-	-	2	6	-	-	8	24
Québec	28	-	11	5	11	40	28	19	142
Ontario	97	73	59	30	9	48	195	121	632
Manitoba	19	32	-	1	9	-	3	-	64
Saskatchewan	21	-	-	6	-	-	9	-	36
**Alberta ..... **	**27**	**-**	**4**	**2**	**-**	**16**	**-**	**4**	**53**
British Columbia	19	-	-	1	27	17	7	5	76
**Canada[2] ..... **	**235**	**105**	**75**	**48**	**104**	**136**	**257**	**162**	**1,122**

1 **Federal Government Science Expenditures by Region, 1982-83 to 1987-88**, Services, Science and Technology Division, Statistics Canada, June 1989.

2 Includes Yukon and Northwest Territories.

13. Federal Government Personnel Engaged in Activities in the Natural Sciences, by Region and Selected Departments, 1987-88[1]

Region	Agriculture	Atomic Energy of Canada Ltd	Energy, Mines and Resources	Environment	Fisheries and Oceans	National Defence	National Research Council	Other	Total
	(person-years)								
Newfoundland	33	-	-	62	239	-	65	66	465
Prince Edward Island ..	107	-	-	14	6	-	1	-	128
Nova Scotia	140	-	134	233	619	209	92	17	1,444
New Brunswick	142	-	-	97	152	-	3	149	543
Québec	413	-	4	584	157	608	313	665	2,744
Ontario	1,654	1,793	2,213	1,324	321	708	2,598	2,982	13,593
Manitoba	360	769	2	240	133	-	21	18	1,543
Saskatchewan	374	-	4	194	-	-	122	-	694
**Alberta ..... **	**477**	**-**	**208**	**453**	**-**	**201**	**3**	**93**	**1,435**
British Columbia	266	-	77	374	478	137	102	168	1,602
**Canada[2] ..... **	**3,966**	**2,562**	**2,663**	**3,692**	**2,105**	**1,863**	**3,320**	**4,172**	**24,343**

1 **Federal Government Science Expenditures by Region, 1982-83 to 1987-88**, Services, Science and Technology Division, Statistics Canada, June 1989.

2 Includes Yukon and Northwest Territories.

Provincial Coordinators

Eight provincial governments sponsored the Science and Technology Statistics Section in the collection of similar scientific activity data. Below is a list of co-ordinators for the various sponsoring departments/ministries.

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